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## Session 3B (ii)

### Administrative and Professional Job Sharing Case Studies

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## INTRODUCTION AND RATIONALE

First of all, what is job sharing?

Job sharing is a voluntary arrangement in which two people share one full-time job, each working part-time, on a regular ongoing basis (Nollen, 1982, p.25). Income and benefits are usually prorated.

Why did I choose job sharing as the topic for my doctoral dissertation? There were three reasons, one personal, one professional, and one "other".

1. For many years I, personally, had "juggled" career and family, seeking a balance so that one would not be sacrificed for the benefit of the other. I came to the conclusion that, even with many support mechanisms in place, it was difficult, if not impossible, to "have it all", at least all at the same time. Job sharing seemed to be an option that would facilitate "easier juggling", allowing for parenting as well as the maintenance of career status.
2. Professionally, but related to the reason stated above, I thought job sharing might be an effective strategy in making educational administration a more viable and/or appealing option for teachers with young families (particularly those in the 25-40 year age category). As it is now, many potential candidates do not consider promotion into administration because of the all-consuming nature of principal and vice-principal positions (i.e., high stress, long hours, many evening meetings). It seemed to me that having the option to job share a principalship or vice-principalship might remove some of the hesitation and perceived barriers for someone considering administration.

3. The timing is right for the introduction of innovative solutions to problems of the 1990s. A still rather "shaky" economic climate characterized by fiscal restraint and cutbacks, paired with organizational rethinking and restructuring, is creating a "readiness" for new work options such as job sharing. An organizational climate in which such collaborative innovation could be nurtured and sustained, and even welcomed, is now in place. The value of partnerships and "two heads being better than one" is now recognized and strict lines of authority associated with the bureaucratic model are becoming blurred in some organizations.

At the same time, isolated incidences of job sharing at administrative levels appear to be becoming more prevalent than previously. There now seems to be a recognition within organizations that the same person is responsible for both work and family. Companies are trying to lessen employee absenteeism and the tension between family goals and corporate goals by the introduction of such work options as job sharing, telecommuting, and flextime. Some large companies, for example Corning, now have a work/life balance department in their organizations. It seems that some organizations are trying to be both competitive and caring by offering options such as job sharing.

#### OVERVIEW/ABSTRACT

The data reported in this paper are drawn from a 1994 study of administrative and professional job sharing done at the Ontario Institute for Studies in Education, University of Toronto. Nine cases of job sharing both inside and outside the field of education were studied. The specific objectives of the study were to examine: the conditions that facilitate or



impede job sharing, the components of administration that can or cannot be shared, the effects of job sharing on how work is done, the effects of job sharing on the individual job sharers and on the organizations for which they work, and the feasibility of job sharing for educational administration.

By means of interviews, questionnaires, observations and documents, data were collected from several stakeholders (job sharers, supervisors, co-workers, and/or subordinates) in each case. An examination of descriptive case portraits and a cross case analysis indicated that eight of the nine cases studied were highly successful and one was moderately successful, with the benefits resulting from the job-sharing arrangements far outweighing the risks. Benefits and risks to the job sharers, their family members, the organizations for which they worked, and other employees of these organizations were identified. Conditions which facilitated and/or impeded job sharing were also identified. Much insight was gained into positions and job components which were easily and not so easily shared, and into the intricacies of collaboration on the job and its effects on how the work was done.

The relationship of the data to five areas related to educational administration, specifically, women in administration, work-family conflict and work redesign, job sharing as a work option, restructuring schools, and leadership, was then examined to determine the implications for, and the feasibility of, job sharing in educational administration.

And, finally, as a start to theory-building in this new area of research, a model for job sharing was developed. To conclude, the results of this study lend strong support to the phenomenon of

administrative/professional job sharing as a helpful strategy for achieving a balance between working and non-working aspects of living.

## RESEARCH DESIGN

A qualitative multiple case research design was used to study the nine cases of administrative/professional job sharing. Pairs of community college administrators, secondary and elementary teachers, school department heads, physiotherapists, bankers, lawyers, engineers and camp directors were interviewed at their place of work. Non-participant observation and policy documents (when a job-sharing policy existed) were also used to collect data. To obtain an accurate overall view of the job-sharing arrangement from different perspectives, five stakeholders in each case were interviewed whenever possible: the job sharers, their supervisor, a co-worker, and a subordinate.

A total of 46 respondents were interviewed. Thirty-three of the 46 respondents were female, and 15 of the 19 job sharers were female. The job sharers totalled 19 rather than 18 because in one case three job sharers were interviewed: the current job sharers and a job sharer who was replaced by one of the current job sharers.

In the first step of the data analysis, each case was described in a detailed individual case portrait. Next, in a cross case analysis, the interview data were examined, categorized, and tabulated by frequency of response within each category. From the descriptive case portrait analysis and the cross case analysis the concepts were linked into an integrated framework or model for job sharing.



Four cases were from the field of education (two in educational administration and two in teaching); and five cases were from outside the field of education in banking, the automotive industry (two cases), health care and recreation. The diversity afforded by such a range of cases from different fields was a distinct benefit to the study allowing for both broader and deeper responses and more valuable comparisons across the cases.

Specifically, the nine cases included the following job sharers:

Inside Education

- 2 Head Teacher-Librarians in a secondary school
- 2 Teachers in a secondary school (one former Department Head and one new Teacher)
- 2 Acting Vice-Presidents-Academic in a community college
- A Principal and a Teacher sharing a teaching position in an elementary school

Outside Education

- 2 Camp Directors (a husband-wife team)
- 2 Lawyers ("Counsel") in a large corporation in the automotive industry
- 2 Support Engineers in another large corporation in the automotive industry
- 2 Corporate and Investment Banking Managers in the head office of a major bank
- 2 Physiotherapists in a large hospital

The duration of the job-sharing arrangements under study varied from five months to eleven years. Two were considered temporary arrangements. one was a pilot project, and the other job-sharing arrangements were considered permanent with plans to continue them indefinitely. All but two cases were currently in operation and ongoing at the time of the interviewing.

Each interview took approximately 40 minutes conducted at various times during the working day. In only one case were four of the respondents interviewed back-to-back during one visit. In the other cases,

separate visits to the workplace were needed to accommodate the schedules of each of the participants which provided more occasions for informal workplace observation.

Three levels of analysis were used in this study. A descriptive analysis was done in the development of individual case portraits or narrative descriptions of each of the nine cases. Interview data, as well as observation and policy data, were included in these descriptions. To portray each case its complete data base was examined, synthesized and interpreted under the following headings: Background Information; Description of the Shared Position and Scheduling; Reasons for Job Sharing; Policy, Benefits and Termination; Special Features; and Participants.

A second level of analysis involved the coding of transcripts and field notes and the development of categories that interpreted the meaning of the interview data. An analysis of the data base of each case was done using commonly recommended classification and categorization methods (Glaser and Strauss, 1967; Bogdan and Biklen, 1982; Yin, 1984; Miles and Huberman, 1984; Goetz and LeCompte, 1984; Woods, 1986; Merriam, 1988; Kirby and McKenna, 1989; and Tesch, 1990).

The data from all nine cases were analyzed collectively in a cross case analysis to protect the identity of the respondents in the individual cases. To do the cross case analysis, a tally of the number of responses identified in each category by the various stakeholders interviewed was recorded. Responses were categorized by respondent group, with a tally of responses in each category identified by each group of stakeholders (i.e., job sharers, supervisors, co-workers, subordinates, extra references.)



Response frequencies were then calculated for each stakeholder group and for the total group of respondents. The response frequency for the total group was then used to rank categories from the most frequently identified to the least frequently identified, except for single responses which were listed separately. Because of the large volume of data collected, a mechanism for deciding which information would be discussed and which could not be discussed due to space limitations was needed. Ranking the categories provided this mechanism. The data summary of the cross case analysis and the discussion of the results predominantly centered around the most frequently identified information. (The raw data were converted to percentages so comparisons could be made.)

A third level of data analysis sought to develop theory by looking for relationships and by explaining trends, patterns, commonalities, and concerns. The results of this third level of analysis are presented in the model for job sharing and the accompanying explanation and discussion.

## **CASE PORTRAITS**

Instead of sharing descriptive details of each case as is done in the original thesis (case by case), I have selected some of the more interesting and unique features from the various cases to describe for the purposes of this paper.

The Head Teacher-Librarian position has been shared for 12 years (seven years at one school and five years at another) with the exception of 1991-1992 when both partners were on a year's leave of absence. Each year, these job sharers must submit a proposal and re-apply for an extension of their job-sharing arrangement. According to policy, to share this position the one teacher (on contract for a full-time position) who "owns" the

position applies for a leave (.5 of a year) and the other teacher/partner who job shares has a contract for a part-time (.5) position. It should be noted, however, that this was unique and in all the other cases, the job shared position was "co-owned" by both partners, each having similar contracts (where applicable) with his/her employer.

Some of the organizations had job-sharing policies and some had none. In some cases where the organization had no policy, the job sharers were in the process of helping to develop policy for their organization. Some job sharers had been instrumental in developing current policy that was already in place. All the job sharers agreed that the existence of a job-sharing policy greatly facilitated job sharing. Most of the job sharers felt like pioneers, "breaking new ground", and one mentioned that her shovel was "getting worn out"!

Many different scheduling arrangements, each tailored to the position and to the needs of the job sharers, were discovered. Each partner working alternate days or each partner working half days were the most common patterns of scheduling. However, other scheduling variations were also very successful. In one case both job sharers worked on Wednesday, an "overlapping" day, and neither worked on Friday. In another case, each partner worked three days one week and two days the next week with one overlapping day every two weeks when both worked on the Tuesday and no one worked on the Thursday of that week. The physiotherapists shared cases and each worked half-time, alternating five days of work one week and five days off the next week (not a "Monday through Friday" cycle, but a "Wednesday, Thursday, Friday, Monday, Tuesday" cycle.)

Scheduling flexibility was a feature of most of the cases, with job sharers "covering" for each other and "trading days" on occasion. In one case, both job sharers chose to work at a peak time when their workload was high and deadlines were approaching, and then were compensated with "time off" at a less busy time (instead of extra pay). In one case, each half-time partner worked three full days per week (with one day overlapping) and received extra holidays equivalent to and in lieu of salary for 0.5 day per week.

In all cases time for good communication between partners was necessary. Sometimes this was built into their schedule with overlapping days, portions of days or noon-hours spent together. Otherwise, communication was done via taped messages or written logs, or phone calls to each other on "switch-over" days or evenings.

The Physiotherapy Department of the large urban hospital where the physiotherapists in this study were employed has had a small number of positions designated for job sharing since 1987, and one of the job sharers in this study had been job sharing since then. Her current partner is the third job sharer with whom she has shared a position (and there is a waiting list of others who would like to job share). This pair of job sharers applied for a promotion together and were successful in being promoted as a pair.

The most common reason cited for job sharing was the establishment of balance in career and family life, while maintaining career status. In one case, job sharing enabled a senior partner to train a more junior partner in certain aspects of the job. In another case, two men were asked to share a vacant administrative position temporarily until the position could



be filled. All who responded remarked on how well these two job sharers complemented each other in expertise, skills, and personalities. The less collaborative job sharer became more collaborative, a skill needed for the position which he later assumed full time. In another case, one principal for two schools opted to job share a teaching position to eliminate the inconvenience and the travelling time between schools. So he was 0.5 principal (mornings) and 0.5 teacher (afternoons) at the same school. A 0.5 teacher was hired to teach his class in the morning.

The Camp Directorship was shared by a husband-wife team who took the position when it was offered to them because it seemed like an ideal opportunity to enjoy the camping experience while earning some additional income. The husband could still teach, and operating the camp office from home allowed the wife to combine the duties of the job with family responsibilities. Neither could have taken on the position full time because of his/her other responsibilities.

Salary and benefits were normally prorated. In some cases the part-time job sharers were not eligible for the same benefits as full-time employees according to company policy. However, in these cases, often the job sharers themselves were allowed to contribute toward the company plan or "top up" the company's contribution on their behalf. In some cases the job sharers received the same benefit package as the full-time employees. In another case, each job sharer received a part-time benefit package which included a maximum of six days per year of sick leave at 60% salary, and the option to participate in medical, dental, and employee savings plans and in management incentive programs. Each is now entitled also to the same short-term and long-term disability package as full-time employees, but the premiums are prorated.

In one case the job sharers had detailed (separate) employment contracts with their employer specifying the details of the job-sharing arrangement under the following headings: Position Title, Salary and Salary Grade, Project Term, Work Days, Vacations, Statutory Holidays, Health Care Plans, Insurance, Leaves of Absence, Pension Plan, Merit Planning and Promotions, Other Programs, and Termination. In another case, the job sharers received an hourly wage plus an additional percentage of their salary in lieu of benefits and holiday pay.

Some interesting and carefully designed termination alternatives were examined, the details of which are too numerous to mention in this paper. In one policy, if the partnership should end, another partner would be sought to share the position with the remaining partner. If no one applied, then the position would revert to a full-time position. In another, on termination of the arrangement, the employer was under no obligation to replace one of the partners or to continue the job-sharing arrangement. And if this full-time shared position was left unfilled for 60 days it could then be filled as either a full-time or part-time position. In another case, the job share could be easily terminated in the first six months by either of the job sharers or the employer, with full-time re-employment (to a comparable position) guaranteed to the employees. However, after six months, the employer did not guarantee re-employment to a full-time salaried position but a job-sharing employee could still apply for positions for which he/she was qualified.

## CROSS CASE ANALYSIS RESULTS

The interview data from all the cases were classified and compared in a cross case analysis. As mentioned previously, eight of the nine cases studied were considered to be highly successful by all respondent groups in each case. One moderately successful case, however, did not elicit positive responses from the supervisor and co-workers who thought that the job sharers were very competent professionals but that the job-sharing partnership was a temporary arrangement that should not be promoted or encouraged within their department.

In the eight very positive cases, similar responses were given from case to case. Within each case remarkably consistent responses were given by each respondent group. Generally, when the job-sharing arrangement was deemed to be a success, all the stakeholders considered it to be a success. And despite the diversity of the various cases, the inter-case consistency of responses was notable. Responses from the cases inside the field of education did not vary widely from those outside the field of education.

In the one moderately successful case, although the job sharers were happy to avail themselves of their company's job-sharing policy, they were also aware of the negative attitudes of the other stakeholders with whom they worked. The job sharers felt like pioneers as job sharing was not common in their organization and was still considered an innovation, not an alternate work option.

The findings of the study which follow section by section have been highly condensed and many have been omitted due to space limitations. Categories of responses were ranked, and rankings were determined by frequency of responses from the total respondent group. The most highly



ranked categories were identified by the largest percentage of respondents. Unfortunately, again due to space limitations, only those categories ranked first, second and third in each section are listed in this paper. In each section which follows, responses are listed in rank order, with the most frequently identified category of responses listed first and the least frequently identified category listed last. (In the original thesis document there are 16 tables listing multiple responses in rank order, and 14 tables listing single responses.) A complete listing can be made available by contacting the author. It should be noted that although response frequency was used as a means of organizing the data, many single responses also provided deep insight into the phenomenon of job sharing and it should not be assumed that they provided less valuable information than the multiple responses. Here are the highlights:

#### Conditions Which Facilitate Job Sharing

- Good communication skills, systems, strategies
- Personal and professional compatibility of the job-sharing partners
- Supportive supervisor and administration (including Human Resources personnel).

#### Conditions Which Impede Job Sharing

- Unequal sharing of responsibilities
- Bureaucratic difficulties/hurdles; traditional hierarchical structures and lines of authority\*
- No job-sharing policy\*
- Resistance to change

\*tied for second ranking.

### Job Components That Can Be Shared

- All \*
  - \* if communication and expectations are clear
  - \* if the strengths and preferences of the partners are built upon
  - \* if the job sharers have a common philosophy
  - \* if the position involves continuous ongoing tasks
  - \* but at what cost to the organization and employees?
  - \* given teamwork and a supportive environment
  - \* if relationships are built up together and clientele are trained to expect to be serviced by both job sharers
  - \* there is no reason why components of administrative positions cannot be shared
- Clients, cases, customers
- Planning and decision-making.

### Job Components That Cannot Be Shared\*

- Student discipline, behaviour problems
- Board commitments, committee work

\*Only two were identified by a small percentage of respondents.

### Job Components That Can Be Divided or Disaggregated

- Job responsibilities and elements (divided by subject, division, or type of work)
- Administrative tasks, the more mechanical parts of the job, day-to-day matters/routine things (e.g. meetings, report-card signing, office work)
- Budgeting, financial management.

### Effects of Job Sharing on How Job Sharers Do Their Work Or How Their Work Is Done

- Improved problem solving; more divergent creative thinking; "two heads are better than one"; more effective
- Better organized; more documentation; up-to-date records and paperwork; routines set up for organization
- More energy and effort at work; better performance; synergy; higher productivity.

### Beneficial Effects of Job Sharing On The Job-Sharing Individuals

- More time for family and personal needs; better home-work balance
- Specialization; some choice; each can do his/her strengths
- Career maintenance and job security\*
- Less stress\*

\*Tied for third ranking.

### Adverse effects of Job Sharing On The Job-Sharing Individuals

- Perceived lack of commitment; put on slower "mommy" track; given less challenging assignments; not considered for promotions
- Unequal sharing of responsibilities (or this perception); one more committed than the other
- Less income; less pension; slower rise on the seniority and pay grids\*
- Possible overload; can't do a full-time job in part-time hours; time limitations\*

\*Tied for third ranking.

### Beneficial Effects of Job Sharing On Organizations

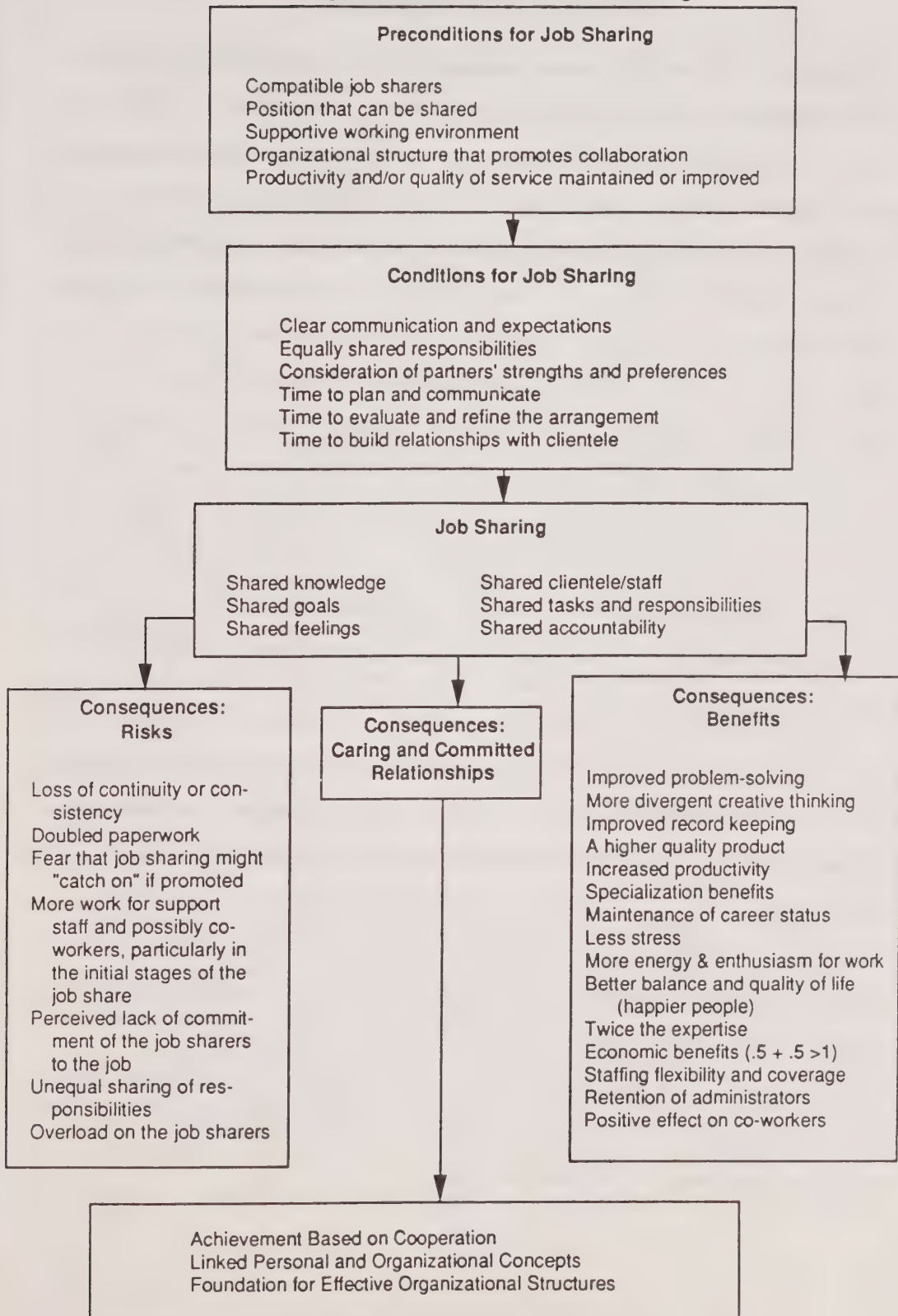
- "Two heads are better than one"; twice the expertise and experience; two personalities and two perspectives available
- Economic benefits; higher productivity; more energy; two part-timers produce more than one full-timer ( $.5 + .5 > 1$ )
- Staffing flexibility; "built-in" coverage (for holidays, sick days, leaves); someone's always there



In summary, many of the respondents expressed their thoughts so precisely that a few interesting quotes relating to selected themes have been included in Appendix A. The quotes themselves provide an excellent summary of the highlights relating to these themes: women in administration, work-family conflict and work redesign, job sharing as a work option, restructuring schools, leadership, and the feasibility of job sharing in educational administration.

#### **CONCLUSION: A MODEL FOR JOB SHARING**

Figure 1 presents an "ideal" model for successful job sharing based on the results of this study. It is the beginning of a theoretical explanation for the success of the job-sharing arrangements studied. Although there is no guarantee for successful job sharing, the use of this model as a guideline for setting up an administrative/professional job-sharing arrangement will hopefully increase the likelihood for success of any job share. Most successful job-sharing situations will not meet all the conditions nor have all the components of the "ideal" model. If some are lacking, this does not necessarily mean that the job-sharing arrangement is doomed to fail or is not feasible under certain circumstances. An important part of the model is an explanation of the success of the administrative/professional job-sharing arrangements examined in this study. Caring and committed relationships resulting from joint effort provide integral links between parts of the model. The parts of the model are explained in the following sections.

**Figure 1 : A Model for Job Sharing**

### Preconditions for Job Sharing

Based on the views of the respondents, five preconditions appear to be necessary before a job-sharing arrangement should be considered. Firstly, two flexible people who are personally and professionally compatible must want to share a position. Both should be experienced at the job with a shared philosophy regarding their role(s). It is helpful if they have previously worked together and/or know each other well. Next, the position being considered for job sharing must be able to accommodate shared leadership. The position must not require complete continuity and consistency that could only be provided by sustained leadership from one individual. Thirdly, the working environment must be supportive, and the administration and staff must be committed to the job-sharing arrangement. The support of the job sharers' immediate supervisor is particularly important. And an organizational job-sharing policy is of great benefit to provide guidelines for the initiation, implementation and termination of a job-sharing arrangement.

The position to be shared must be part of an organizational structure that allows for and/or promotes collaboration and shared decision-making. Too many rigid hierarchical lines of authority and bureaucratic hurdles can inhibit collegiality and teamwork, both necessary ingredients for successful job sharing. And, lastly, it must be anticipated that the productivity and/or quality of service will at least be maintained and hopefully improved as a direct result of the job share. It must make not only good moral sense but also good business sense for two people to share the position, and the benefits of doing so must be identifiable to the various stakeholders in the organization.



### Conditions For Job Sharing

After the preconditions have been met, several other conditions will help to promote a successful job-sharing arrangement: clear communication and expectations, equally shared responsibilities, consideration of the partners' strengths and preferences, time to plan and communicate, time to evaluate and refine the arrangement (to work out "the kinks"), and time to build relationships with clientele.

### Job Sharing

The joint effort entailed in job sharing is multidimensional. Sharing administrative/professional positions results in shared knowledge, shared goals, shared feelings, shared values, sometimes shared clientele and/or staff, shared tasks and responsibilities, and shared accountability. When two people work closely in a shared position their joint effort results in a deep knowledge and understanding of one another and trust. They also share a thorough knowledge of the job and the skills required to do the job. In addition to shared knowledge, job sharers share goals and have a joint mission. This results in a sense of teamwork with a focus on the goals of the position and fewer personal "getting ahead" motives.

Feelings are also shared between job sharers. There are the shared feelings, for example, of being pioneers together, of meeting deadline pressures together, and of joint accomplishments. Job sharers have the comfort of knowing that while one is away from work the other is at work and things are progressing. In many cases job sharers also share values and priorities. The job-sharing mothers of young families in this study, for example, shared similar work-family priorities but also valued their

careers. Relationships with those with whom job sharers work (supervisors, co-workers, and subordinates) are developed together. In some cases, the clientele or customers being serviced are also shared.

Tasks and responsibilities of the positions are shared as well as accountability. Depending on the preferences and strengths of the job sharers and the type of position that is to be shared three ways of sharing a position's tasks and responsibilities are possible:

- a) Share everything. Each job sharer carries out all the tasks and responsibilities of the position whenever he/she is at work. Good communication between job sharers is a key ingredient in this type of arrangement, particularly if building relationships with clients is a part of the job.
- b) Divide the tasks and responsibilities using some logical method, for example, by subject, division, type of work, strengths, preferences, etc.
- c) Some combination of a) and b) in which some tasks and responsibilities are shared and others are divided (and predominantly done by one person).

Particularly in a) and c) accountability is shared. Compliments come to both job sharers for a job well done, but both are held accountable if problems arise.

### Consequences of Job Sharing: Benefits

Several benefits can be expected to be the result of a successful job-sharing arrangement: improved problem solving, more divergent creative thinking, improved record keeping, a higher quality product, increased productivity, specialization benefits, maintenance of career status, less stress, more energy and enthusiasm for work, a better balance and quality of life (happier people), twice the expertise, economic benefits (.5 + .5 >1), staffing flexibility and coverage, retention of administrators, and a positive effect on co-workers. These benefits include individual, organizational and work process/product related benefits but all directly or indirectly affect one another.

### Consequences of Job Sharing: Risks

It is helpful to be aware of some risks and/or pitfalls that may be encountered during a job share. These include: loss of continuity or consistency, doubled paperwork, a fear that job sharing might "catch on" if promoted, more work for support staff and possibly co-workers (particularly in the initial stages of the job share), perceived lack of commitment of the job sharers for the job, unequal sharing of responsibilities, and overload on the job sharers.

### Consequences of Job Sharing: Caring and Committed Relationships

Johnson (as cited by Beck, 1992) theorizes that joint efforts to achieve tend to create caring relationships, and achievement is powered by caring and committed personal relationships (Beck, 1992, p.476). The findings of this study confirm this theory - all the job sharers showed a



high level of commitment toward and a caring for each other (and also a high level of commitment to the job). Caring and commitment appear to result from job sharing, and these relationships provide some of the power and motivation to achieve on the job. As presented in Figure 1, caring and committed relationships underlie achievement, link personal and organizational concerns, and provide a foundation for effective organizational structures.

A word of caution will end this paper. One of the principals in this study who was very supportive of job sharing and had helped set up a job-sharing arrangement for two teachers on her staff stated, "My position could not be shared." I couldn't help but wonder if what she really meant was, "I could not share my position"! It is important that a distinction be made between these two statements when job sharing is being considered. It may be that some positions could not be shared, but it is certain that some people could not share their positions.

#### SUGGESTIONS FOR FURTHER RESEARCH

This study sets the stage for further research into administrative and professional job sharing. One possible means to happier employees is the provision of flexible work options, such as job sharing, to meet the needs of individual employees (as identified by one of the supervisors in this study). Further study could be done on different non-monetary ways to reward employees and their effects on such variables as employee motivation, job satisfaction, productivity, stress levels and work-family conflict. As one supervisor in this study commented, "When salaries are frozen, other means of keeping employees happy must be found."

Several areas related to research on restructuring and new models for leadership could be studied further: the limitations of bureaucracy and confining organizational structures, shared decision-making and shared accountability, leaders' attitudes toward job sharing (which could give clues regarding their ability or inability to shift leadership paradigms), the role of the administrator in organizations with a horizontal division of labour, and the role of the administrator in other types of restructured organizations.

Over the longer term, it would be interesting to determine if the availability of job sharing or other more flexible work options would attract more women or men into administration, particularly those in the 25-40 year age grouping with young families. With equity such a prominent issue, it is not only important that men and women be treated fairly, but also that equity be available to those of all ages, with and without families.

Many other questions need further study to be answered. What are the costs to organizations of initiating and implementing job sharing? Why are more companies not promoting job sharing and other flexible work options? In those organizations which do have a job-sharing policy, why are more employees not opting for this work option? Why are job sharers perceived by some as less committed to the job than full-time workers? Does the present system of work benefit some and not others, and would job sharing pose a threat to those in power? What are the relationships between joint effort, caring and commitment, and the overall positive effects of job sharing? Is job sharing as a work option more attractive to certain types of employees than to others, and why or why not?

In conclusion, although this study has answered numerous questions about job sharing and its applicability for professional and administrative positions, many more questions have been raised. The results of this study do lend strong support, however, to the phenomenon of administrative and professional job sharing as a helpful strategy for achieving the sometimes elusive balance between working and non-working aspects of living. Individuals and organizations are both beneficiaries of job sharing.



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## APPENDIX A

### Interesting Quotes Relating to Selected Themes





## APPENDIX A

### Interesting Quotes Relating to Selected Themes

#### Women in Administration

- A supervisor: We are able to keep their knowledge, which I don't think we would have been able to do without job sharing. Neither one of them would have been willing to work full-time. The bank has invested years in training them, and now we are able to reap those benefits.
- A job sharer: By job sharing you make a statement to the organization that I like what I do, but I'm not ready for the challenges that something else will give me right now because I have other things in my life. Job sharing gives you balance, but not it all.
- A job sharer: My job sharing partner and I are the same people now as when we worked full-time. We are both dedicated people who want responsibility and want to do a good job. The only difference now is that we are viewed much differently by the organization. We are not treated with the same respect as our peers. The organization looks at this as a temporary measure of great sacrifice to them to assist us through a difficult short-term period in our careers. They are only interested in when we are going to work full-time.
- A job sharer: I would hate to see job sharing become a political tool. For example, I would not like to see shared administration become a lesser form of administration than full-time administration.

Work-Family Conflict and Work Redesign

A sarcastic job sharer: I have 20 hours per week to do 40 hours of family-related work and 20 hours per week to do business-related work. What a deal!

A supervisor: It just seems to me to be foolish to have people under-employed or unemployed because they wish to spend time with their families. I think as a society we must be willing to let parents have some flexibility.

A co-worker: I think it makes it easy for the job sharers from a family point of view, and it is fairly stressful in here. They are a lot more stable because they are only here 2-3 days per week and they are not as stressed as if working full-time. The stress level is less, and that helps overall.

A job sharer: I think job sharing is a great work alternative. It certainly fits today's challenges. I think there are a lot of people working full-time who wish they had the opportunity to job share but can't. Most organizations are very thinly staffed, the work piles up, and I have to believe if you can't manage that work level effectively you are going to crack. But knowing that you have a balance between work and home and can give your all when you're here and knowing that things are progressing and moving forward when you're not here, you tend to have a much more positive outlook on work.

Job Sharing As A Work Option

A supervisor: Job sharing is not done because few people ask for it. If it were done more often, more people would realize the benefits of it, and it would become more popular. More work is obtained from two people doing one job.

A job sharer: I would be prepared to go with the job sharing indefinitely. It does involve you in a kind of community that this particular job doesn't. It's not that there is anything inherently wrong in being lonely, but I think it has a more sustainable job pay-off. I think it has long-term viability and maybe that's why the temporal quality of the expression "job share" is something that will do for now, as opposed to a normal thing. There is something about full-time that says "normal" and anything else is not normal, and I don't think that is a useful idea anymore. We need to get through the cultural aspects and legitimize this. It was regarded in this college as a temporary thing.

His job-sharing partner: In another era we might have continued to job share. The main impediment to job sharing is tradition; the main facilitator for job sharing is a good administrative assistant.



Restructuring Schools

- A job sharer: The read on the job sharing was that it was a success. I think the benefits primarily have to do with words like participation, collaboration, integration, synergy and so on. There was a domino effect.
- A co-worker: One of the major hurdles that we have overcome is the bureaucratic things that get in the way, from job descriptions through to the territorial prerogatives. If we can get past that stuff I think we can do some really effective things. I certainly think that we need to take more advantage of sharing the various aspects of administration even outside the milieu of administration. We don't do a very good job of taking advantage of the expertise and resources that are available in other working groups in the college. People are pigeon-holed too much.
- A job sharer: I think job sharing reduces some of the bureaucratic inefficiencies that have to do with hierarchies. On the other hand, some decisions that really did need to be closed on were perhaps massaged too long.
- A job sharer: I think the governing structure of the organization has a lot to do with whether or not you can go into these kinds of assignments because it does sort of mess up conventional accountability, and the CEO needs nice clean lines that report to him or her. In other words, the issue is often not what the community needs, but what does the senior level need, and what does the board of trustees need, and that happens so often.

## Leadership

- A supervisor: The job-sharing experience benefited both job sharers. Each learned from the strengths of the other and they honed their skills as both team members and as team leaders. The experience of shared accountability also gave an additional measure of self-confidence to the job sharers.
- A job sharer: It was difficult letting go of the reins after eight years, and giving over half your job, always wondering if the other one is doing a better job than you are. It was a little bit threatening in a sense that I was sensitive to the loss of control of the whole job.

## The Feasibility of Job Sharing in Educational Administration

- A job sharer: Job sharing in educational administration is feasible as long as the philosophy of the school is set. Consistency is key.
- A job sharer: I feel that administrative job sharing can be not only feasible but beneficial, if we have the right job and the right parties, not only matched to each other but also matched to the job.
- A co-worker: Job sharing in educational administration should be feasible. As a taxpayer I get angry when people gain experience through my tax dollars; and then possibly are not being used, or are doing a less-than-adequate job because other demands on them have increased.
- A supervisor: Policy and clerical things are not as critical as the relationships. As long as you have two administrators who spend the time to develop individual relationships with students, teachers and parents, then job sharing in educational administration is feasible, absolutely.

- A co-worker: I think the vice-principal's job would be relatively easy to job share. As a parent, I wouldn't mind talking to different vice-principals. To me it is not different than when they change principals during the year. If you're going to the principal, you expect him to look at your child's record anyway and read through what has been documented.
- A supervisor: In a secondary school two vice-principals could share authority and discipline. But the principal's position needs the continuity of a single person for relationship building. The principalship is more than a position, it's the physical presence of an individual person, and this is important for adolescents.
- A supervisor: Within schools job sharing and teamwork would work well and eliminate the competitiveness between aspiring administrators. More administrators would be serving students first (as it should be) as opposed to their own aspirations and career ambitions.
- A job sharer: The principals share administrative tasks in a regular school now. The principal is ultimately in charge and it is not just the two of them sharing. All of the teaching staff share the same mission as a team; cooperation is needed. The educators have an advantage in some ways because the staff and students have a common mission and there is more cooperation and teamwork necessary and already present in this field than in other fields.

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## **Session 5 (iii)**

### **Economic Activities and the Demand for Work Sharing in Canada**

Tom Siedule, Carol Guest and Ging Wong  
Human Resources Development Canada

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# Economic Activities and the Demand for Work Sharing in Canada

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## **Abstract**

This paper uses econometric methods, macro-model simulations, and micro-simulation techniques to estimate the relationship between economic activities and the demand for work-sharing in 1990. The quantitative work is based primarily on the cross-sectional survey data collected for Employment and Immigration Canada's 1993 evaluation on the Work Sharing program, along with the unpublished UI-regional data from the Labour Force Survey. It finds that the demand for work-sharing is indeed sensitive to changes in economic activities. However, within a reasonable range of demand shocks, any increased demand for work-sharing would probably be too small to create a serious problem for the UI Account. Although the Work Sharing program has basically been a passive policy reacting to the demand of firms, it has served a limited but useful function in the Canadian labour market. The relatively small size of the program and its present design prevent work-sharing from being used actively for comprehensive job creation and adjustment to technological changes.

## **I. Introduction**

In an era when workforces are being "downsized", "re-engineered" and "rationalized" with increasing frequency, it is appropriate to examine changes in working time. Related to this theme is an idea that emerged in the 1970s, that of short-time compensation or work-sharing, which is currently receiving increased scrutiny.

Work-sharing refers to work-time arrangements in which all members of a work group reduce their hours of work to prevent the layoff of some members of the group. The reduction in working time and the associated reduction in income are thus redistributed over the entire work unit, rather than being concentrated on a few workers.

In Canada this arrangement is formalized as the Work Sharing program under the authority of the *Unemployment Insurance Act*. Canadian Work Sharing was introduced as a pilot program in 1977 and was modelled on similar programs in effect in Europe. In 1981, in response to growing numbers of layoffs, the program was fully implemented and has been available since that time.

The Work Sharing program is based on the premise that it is better to keep workers employed than to have them experience a period of unemployment. Thus, its main objective is "to maintain local, regional and industrial employment levels during periods of short-term adverse economic conditions". Work Sharing also has secondary objectives for both firms and employees. For firms, the program aims to assist them in retaining intact their skilled work force and to help them avoid the costs associated with temporary layoffs such as recruiting and training new employees. For employees, the program aims to improve the level of income for workers who would otherwise be laid off and to assist workers in maintaining their skill levels and work motivation and reducing dislocation and uncertainty.

Under a Work Sharing agreement, lay offs are averted or postponed by reducing the work week of employees in the designated core work group. An employer who intended to lay off 20

percent of employees for three months may use Work Sharing to reduce working hours of all employees by 20 percent over the same three month period. Lost wages due to reductions of regular working hours are partially compensated by UI benefits. Approximately 60 percent of lost wages are covered by UI benefits, charged to the premium portion of the UI Account. A UI-approved Work Sharing agreement is made between three parties: to be established the proposal must be accepted by management, a majority of the affected workers and Human Resources Development Canada (HRDC). Workers who apply for UI under Work Sharing do not have to serve the usual 2 week waiting period for benefits. Employers must maintain fringe benefits for the duration of the Work Sharing agreement. Work Sharing agreements may last for 26 weeks and may be extended to 38 weeks under special circumstances.

A major evaluation of the program was completed in 1993, covering the years 1989 and 1990. The evaluation examined a sample of firms which used Work Sharing. Comparison firms were pre-screened and included in the sample if they had seriously considered laying off at least 20 percent of the members of one of their business units due to adverse economic circumstances. This procedure identified a sample of comparison firms who met the Work Sharing eligibility criteria but did not participate in Work Sharing.

The evaluation found that Work Sharing clearly avoids layoffs. However, in some cases layoffs may have been avoided without the Work Sharing program — analysis of comparison firms showed that 7 percent of these firms did not layoff any employees. Further, in 29 percent of the Work Sharing cases, layoffs which should have been avoided by the program were merely postponed by the program, as these employees were laid off in the 6 months following program participation. Of these layoffs, 75 percent were of a permanent nature. Thus, in total, 64 percent of the layoffs that should have been averted by participation in Work Sharing can be said to have been avoided as a result of the program. Comparison with the 1984 evaluation of the same program found that the program was somewhat less successful in avoiding layoffs in 1989/90 than it was in 1983.



The evaluation found significant benefits of Work Sharing participation for workers.

Participants who would have most likely suffered a layoff did much better than their comparison group counterparts who were laid off, experiencing a 19 percent reduction in income versus a 47 percent reduction of the layoff group. The Work Sharing group displayed much higher levels of morale, better attitudes to work and management, better social relations and better physical and psychological health vis à vis those in the layoff situation.

Firms also experienced benefits from Work Sharing participation. They maintain the Work Sharing unit intact, and expend \$800 to \$1,800 less per layoff equivalent than comparison employers. They also returned to full production sooner than firms that laid off employees. However, there was no longer-term profitability or productivity advantage for these firms. This may suggest that Work Sharing is an appropriate tool to help firms deal with cyclical fluctuations in demand, but not for those firms facing fundamental, structural changes.

Work Sharing was found to be more expensive for the UI fund than was the layoff alternative. Costs were 33 percent higher for Work Sharing due to three factors: the waiver of the 2 week UI waiting period for Work Sharers, the fact that 30 percent of layoffs never collected UI, and the incidence of layoffs in the post-Work Sharing period.

However, to balance this additional cost, there were also significant social benefits. The evaluation estimated that Work Sharing helped avoid costs related to the stress of unemployment, avoidance of costs related to unemployment scarring, and financial benefits to participating firms. Overall, the evaluation estimates a benefit to cost ratio of about 2.6 to 1.

While the 1993 evaluation answered many of the questions about the program, it did not examine the issue of potential demand for the Work Sharing program. A number of questions remain: "If the expansion phase of the business cycle of the 1980s had ended earlier, what would have been the demand for UI-subsidized Work Sharing?"; "What would have been the additional cost?"; and, "Would it have created a significant imbalance for the UI Account?". This paper attempts to

answer these questions empirically.

## II. Methodology

From our recent survey of the existing literature on work-sharing (or short-time compensation), we have learned that the theoretical development in this field is primarily concerned with work-sharing's effectiveness as a policy measure for alleviating the unemployment problem during recession.<sup>1</sup> In most of the theoretical discussions, the demand for work-sharing has been taken as an inevitable phenomenon: during an economic downturn, some firms prefer to use work-sharing to layoffs as an adjustment mechanism. Thus, other than relating demand for work-sharing to business fluctuation, the existing literature is not very helpful in providing theoretical guidelines for specifying the demand for work-sharing equation. This problem is further complicated by the lack of useful time series for a comprehensive empirical investigation on this topic. Although the administrative files contain some aggregate time series on the number of work-sharing applications approved, number of individuals in the program, and program expenditures, they have hardly any information on the behaviour and characteristics of work-sharing participating and non-participating firms. Thus, the idea of deriving a demand for work-sharing equation from existing theories and estimating it directly from available data do not presently seem to be a feasible approach.

Recognizing the problems mentioned above, the quantitative work of this study circumvents the difficulty by working mainly with the cross-sectional data collected for Employment and Immigration Canada's 1993 evaluation.<sup>2</sup> Because these data have certain limitations, a specific methodology has to be developed to deal with them. The quantitative work includes four related components:

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<sup>1</sup> See, for example, MaCoy and Morand (1984), and Owen (1989).

<sup>2</sup> See Employment and Immigration Canada (1993).

- Estimating a logistic equation that describes a firm's probability of participating in the Work Sharing program.
- Creating a relatively depressed scenario for the late 1980s (1987-90) from a full-system econometric model simulation.
- Calculating the number of firms that would have become work-sharing participants in the more depressed scenario.
- Calculating the cost of the additional demand and its impacts on the UI Account.

*The logistic (program participation) equation as a demand function*

The logistic equation may be interpreted as a micro demand for work-sharing equation. It estimates the probability of a typical firm that would participate in the Work Sharing program in 1990. The micro data are primarily from a special survey that Employment and Immigration Canada (EIC) used to conduct its 1993 evaluation on the Work Sharing program. The data consist of 310 participating and 256 non-participating firms in 1990.<sup>3</sup> The participating employer sample was selected from an administrative file that contained the names of work-sharing firms during 1990. Members of the comparison group sample were selected from the EIC Record of Employment file; these firms were selected on the basis of their comparability to work-sharing firms in characteristics and activity experience<sup>4</sup> (e.g., members of the comparison group must have laid off workers in 1990.) In carrying out the econometric estimation, the procedure requires full information (no missing data points) for the dependent and independent variables. Because of missing values for selected variables, 43 firms have to be excluded from the sample. Thus, the final econometric estimation is based on the information from 289

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<sup>3</sup> The survey also contains information for the year 1989. Because of the time constraint, we have decided not to duplicate the empirical work for 1989. In the early stages of an economic downturn, firms are not sure whether dismissals and long-term layoffs are necessary, their demand for work-sharing may be different from those at different points of the business cycle. Future work on this topic should probably investigate the sensitivity of work-sharing demand at different points of the business cycle as well.

<sup>4</sup> For a detailed description of survey design and characteristics of participating firms and members of the comparison group, see Employment and Immigration Canada (1993).

participating firms and 234 members of the group of comparable employers.

Ideally output or sales data for periods immediately prior to the firm's applying for work-sharing participation (program participants) or laying off workers (members of the comparison group) should be used as a measure of the firm's business fluctuation. Unfortunately, the survey was not designed to deal with the demand issue and did not collect any output or sales data. This forces us to search for a suitable proxy. The proxy used is the unemployment rate of the UI region where the firm is located. This variable is chosen for two reasons. First, even though the unemployment rate where the firm is located, by definition, cannot claim to be a *unique* economic activity indicator of the firm, it is specific to the economic climate where the firm operates. Second, the time series for this variable is available. The data are from Statistics Canada's Labour Force Survey unpublished worksheets. We have the UI region data on labour force, employment, unemployment, and unemployment rate dating back to 1979. The availability of these time series is operationally very important, because it allows us to introduce a dynamic element into the specification of the equation specification. (See the discussion below.)

Even if one accepts the UI regional unemployment rate as a reasonable proxy for approximating economic downturns, proper *timing* and *functional form* remain crucial to the specification of the probability of program participation equation. First, using the regional unemployment rate of 1990 as an explanatory variable would present a serious technical problem. In 1990, the participating firms were already in the Work Sharing program. If the program was effective in lowering unemployment, then the UI regional unemployment rate of 1990 would also be dependent upon the extent of program participation within the UI region. This *simultaneity bias* presents an interpretation problem, because the estimated equation would have mixed the program's effects on regional unemployment with the influence of economic activities on the demand for work-sharing. Second, if a firm uses UI subsidized work-sharing as an adjustment mechanism for the *decline in the demand* for its products, then the proxy variable should probably be in the *first difference form* rather than *level form*. This line of reasoning suggests



that the proper variable for explaining a firm's probability for program participation should be the *change* in the unemployment experience of the UI region prior to the firm's decision to join (or not to join) the Work Sharing program.<sup>5</sup> This specification would not have been operational, if the time series for the UI regional unemployment rate is not available. Symbolically, the specification for the program participation equation may be summarized as follows:

$$\begin{aligned} &\text{The probability of participating in the Work Sharing program of firm "i" =} \\ &f(\Delta \text{URATE}_{i,t-1}, X_{i,t}), \end{aligned}$$

where "i" refers to the firm in question.  $\Delta \text{URATE}_{i,t-1} = \text{URATE}_{i,t-1} - \text{URATE}_{i,t-2}$ ,  $\text{URATE}_{i,t}$  denotes the unemployment rate of the UI region where firm "i" is located, "t" refers to the current period, and "t-1" the period prior to participating in the Work Sharing program.  $X_i$  represents a vector of firm specific attributes, including the average skill rating of the firm's employees, percentage of employees unionized, organization structure (whether the firm operated at one single location, multiple locations in one province, multiple locations across Canada, or multiple locations internationally), the firm's industrial affiliation, the firm's years of operation, etc. Although our interest is primarily in the change in UI regional unemployment rate variable, these other variables are also essential because they help to control the effects of other exogenous forces on a firm's participation decision.

The logistic equation, when estimated, serves certain purposes. First, it tests the hypothesis that the demand for work-sharing depends on changes in economic activities. If the estimated coefficient for the  $\Delta \text{URATE}_{i,t-1}$  variable is positive and statistically significant, it would confirm that more firms would like to become program participants as the economic climate worsens.

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<sup>5</sup> Empirically, when the level of regional unemployment rate enters the right-hand side of the equation, the coefficient is positive but statistically insignificant. On the other hand, the first difference of the regional unemployment rate is statistically significant, and the result seems quite robust. The inclusion or exclusion of other explanatory variables in the specification does not significantly alter the result.



Second, it provides the reader with some information on which other exogenous forces influence a firm's program participation decision. Third, the estimated equation provides us a means of calculating a firm's probability of participating in the Work Sharing program under various unemployment conditions. This last function is crucial to the theme of this study and will later become apparent.

#### *A more depressed scenario for 1987-90*

The logistic equation by itself is still not capable of answering the questions posed in the introductory section of this paper. For example, the estimated logistic equation would show that if the expansion phase of the business cycle of the 1980s ended earlier than it did, more firms would have probably wanted to join the Work Sharing program. This does not give us a quantitative estimate of the size of the additional demand that could have resulted from a more depressed economic climate in the late 1980s. Apparently, one cannot obtain such a quantitative estimate without specifying the deterioration of economic activities in quantitative terms. The simplest way to meet this information requirement is to assume that the total unemployment rate in the late 1980s was higher than its historical counterpart by specific percentage points. These figures can then be distributed proportionally to the UI regions to yield a set of hypothetical UI regional unemployment rates, which can in turn be fed into the logistic equation for further investigation. In this study, we prefer a more plausible hypothetical scenario than the arbitrarily assumed one. The hypothetical (more depressed) scenario used in this study is from the solution of a full-system econometric model<sup>6</sup>, in which Canadian exports, including automobiles and parts but excluding other manufactured goods and mining products<sup>7</sup>, in 1987-90 were assumed to be 10 percent less than they actually were historically. In this hypothetical setting, because of the

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<sup>6</sup> The econometric model consists of about 300 behavioural equations and identities. It is a modified and extended version of the Conference Board's PC-Canadian Model (PCCDN). See Conference Board of Canada (1989).

<sup>7</sup> The exports of other manufacturing goods and mining products are endogenously determined in the full-system econometric model.

decline in aggregate demand resulting from the assumed drop in exports, more individuals were expected to become unemployed. The additional unemployed individuals can then be distributed to the UI regions according to their labour force shares. From these new unemployment figures we may calculate the UI regional unemployment rates for the hypothetical scenario.

### *Probability calculations and random draws*

The estimated logistic equation, the actual UI regional unemployment rates, and the UI regional unemployment rates for the hypothetical scenario provide us with the required tools and information for calculating the probability of program participation for each firm for two scenarios (base-case and the hypothetical). First, for the base-case, we obtain a set of probability estimates for all firms (including participants and members of the comparison group) by inserting the actual values of all explanatory variables into the *unscrambled* logistic equation<sup>8</sup>. Similarly, for the hypothetical scenario, by replacing the actual UI regional unemployment rates with their hypothetical counterparts while keeping the actual values of other explanatory variables unchanged, we may calculate a set of estimates for the firms' chances of participating in the Work Sharing program under the more depressed economic climate.

The estimated probability provides us with the information concerning a firm's chance of becoming a program participant, but it still does not tell us whether or not the firm would indeed be in the program. After all, even a firm with a probability of 90 percent of participation still has a slim chance of not being a participant. In this study, we use the random-draw simulation technique to determine whether a firm is "*in or out*" of the Work Sharing program. The procedure is identical to drawing a "*chip*" randomly from a hat. For example, the participation probability for a certain firm was usually 70 percent (the "*base-case*"), but under the more

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<sup>8</sup> The dependent variable for the estimated logistic equation is in the form of  $\ln [p/(1-p)]$ , where  $p$  denotes the probability of program participation. Feeding the values of the explanatory variables directly into the estimated equation would give us the "*ln odds*" rather than the probability.

depressed economic climate of the hypothetical scenario its probability increased to 71 percent in 1990. To determine whether or not this firm would become a program participant in the base-case and in the hypothetical scenario, we create two separate hats. The first hat would have 70 chips marked “in” and 30 marked “out”, while the second hat 71 chips marked “in” and 29 chips marked “out” to reflect its slightly higher probability of program participation. We would then randomly draw one chip from each of the hats and record the results of the random draws. Repeat the same procedures for all firms in the sample. The difference between the total numbers of “in” firms in the two scenarios (base-case and hypothetical) would be taken as the estimated impacts of the more depressed economic climate on the demand for work-sharing. This is, however, only the result of one random-draw experiment. For this study, we have performed 10 independent experiments, and the average of the 10 experiments is taken as the final estimate for the investigation reported here.

#### *Cost calculations*

The last step involves calculating the funds needed to finance the additional demand for work-sharing. This can be easily calculated from the information available in the administrative files, and there is no need to elaborate on the procedures here. However, we should point out that the simulation exercises only give us the estimate based on a sample size of 523 firms. This estimate would have to “blow up” proportionally to the total economy to yield an estimate of the additional number of firms in the economy that would have required work-sharing under the circumstances of a more depressed economic climate.

### **III. Empirical and simulation results**

This section highlights the salient features of the empirical and simulation results of the quantitative work outlined above.

#### *The estimated logistic equation*

This is the first major component of the quantitative work of this study. The estimated coefficients and essential statistics are as follows:

### Estimated Logistic Equation

Dependent Variable: Employer Program Participation (1=Yes, 0=No)  
 Number of firms included in the analysis: 523

-2Log Likelihood                      651.791  
 Goodness of Fit                        525.196

	Chi-Square	df	Significance
Model Chi-Square	67.446	12	0.0000
Improvement	67.446	12	0.0000

Variable	Coefficient	Standard Error	Wald	Significance
Employee's average skill rating	0.2122	0.0710	8.9247	0.0028
Recent change in the UI region unemployment rate	0.2777	0.1370	4.1089	0.0427
Organization operate at:				
Single location	0.2517	0.2907	0.7499	0.3865
Multiple (across Canada)	0.0630	0.4005	0.0247	0.8750
Multiple (international)	-1.1829	0.5089	5.4041	0.0201
Multiple (one province)	0.0000			
Type of industry				
Primary	-0.9615	0.5581	2.9682	0.0849
Heavy manufacturing	0.1080	0.2558	0.1784	0.6728
Construction	-1.3049	0.3497	13.9260	0.0002
Trade	0.4674	0.2830	2.7285	0.0986
Other	0.4110	0.3381	1.4778	0.2241
Light manufacturing	0.0000			
Percentage of employees unionized	-0.0036	0.0019	3.5111	0.0610
Years of operation	0.0079	0.0046	2.9362	0.0866
Constant	-0.9074	0.4469	4.1226	0.0423

In addition to the explanatory variables listed above, earlier versions of the estimated equation also included “type of organizations (private sector, public or non-profit organizations)”,



“number of full-time workers employed by the firm”, and “provincial dummies” on the right-hand side of the equation. They were subsequently dropped for various reasons. The effects of provincial differences were conceptually and empirically reflected in the “recent changes in the UI region unemployment rate” variable. Therefore, it was not necessary to include provincial dummies as additional explanatory variables. The other variables were excluded, because they were statistically insignificant, and their exclusion did not noticeably affect the estimated coefficients of the other explanatory variables.

Although our main interest is in the “recent changes in the UI region unemployment rate” variable, the estimated coefficients of other explanatory variables are also of some relevance. The empirical results are generally consistent with our *a priori* expectation. “Employee’s average skill rating<sup>9</sup>” significantly influences a firm’s probability of using the Work Sharing program. All other things being equal, a firm with many highly skilled workers tends to use the UI-subsidized work-sharing as the demand adjustment mechanism more often than firms that employ a relatively large number of unskilled workers. This is consistent with the notion that the option of work-sharing participation rests mostly with employers. It is the cost minimization conditions that determine this behaviour: Laid-off workers of relatively high skills are more likely not available for subsequent rehiring when the firm’s business starts to pick up; training new workers to fill these positions would be a relatively costly option to the firm.

The age of a firm’s establishment (in terms of their years of operation) also seems to have a positive influence on the firm’s program participation decision, but this result is not statistically persuasive. (The estimated coefficient is statistically significant at the 10 percent but not at the 5 percent level.) How long the firm has been in business should not greatly affect its present profit maximization (or cost minimization) conditions. Thus, the estimated coefficient of this

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<sup>9</sup> In the survey, the employer was asked to rate the firm’s employees’ literary skills, numeracy skills, and technological literacy separately, with a rating of 1 denoting extremely low in the category, 4 average, and 7 extremely high. The variable used in the logistic regression equation is the average of the three skill variables.

variable is meaningful only if it is an approximation of the firm's outlook of future business prospect. In other words, a more established firm tends to be more optimistic of its future than the relatively new companies. Therefore, it is more willing to use-work sharing to maintain its labour force during business slow-downs. The unionization of workers exerts a negative influence on the firm's participation probability. The statistical result is, however, not as strong as expected. While most of the local unions prefer work-sharing to worker laying-off during economic downturns, very few centralized unions endorse the work-sharing option because it erodes the seniority principle. These two opposite forces are probably sufficient to prevent this variable from becoming statistically very strong. The organization and industry dummies present a mixed bag of results. Some are highly significant and some are not significant at all. As a principle, we keep all of them in the estimated equation, even though dropping the insignificant dummies would not have affected the rest of the estimated coefficients noticeably.

The estimated coefficient for the "recent change in the UI region unemployment rate" variable is 0.2777 and is statistically significant at the 4 per level. Because the estimated coefficient corresponds to the dependent variable in a log (odds) form<sup>10</sup>, we cannot directly see the impacts of this variable on the firm's probability of program participation. The positive coefficient, nevertheless, indicates that as the economic conditions of the UI region deteriorate, the firm's probability of participation increases. Later in this section, we will provide some impact estimates based on the estimated equation and simulation techniques.

### *The hypothetical scenario*

The hypothetical scenario used in this study is generated from the simulations of a full-system econometric model, in which Canadian exports of non-manufacturing/non-mining products, and exports of automobiles and parts in 1987-90 were assumed to be 10 percent less than they actually were. This assumption on exports effectively lowered total Canadian exports in 1987-

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<sup>10</sup> That is,  $\ln [p/(1-p)]$ , where  $p$  denotes the probability of Work Sharing participation.

90. The quantitative magnitudes are illustrated in Figure 1.<sup>11</sup> The end result is that, in the hypothetical scenario, more individuals would have been unemployed and its impacts on the total unemployment rate were noticeable (0.70, 1.37, 1.49, and 1.50 percentage points higher than the historical figures in 1987, 1988, 1989, and 1990 respectively.) The unemployment rates for the actual and hypothetical scenarios are graphically presented in Figure 2. Furthermore, we have distributed the additional unemployed individuals (not shown here but available in the solutions of the model simulations) of the hypothetical scenario across 49 UI regions, according to the labour shares of the UI regions, and recalculated the UI regional unemployment rates for the more depressed (hypothetical) scenario.

Although this macro simulation is not essential to the quantitative work of this study, we have decided to use it. The model solution generates a reasonably realistic but more depressed economy than the actual experience of 1987-90. It also illustrates that exogenous forces could have easily ended the expansion phase of the 1980s' business cycle much earlier than it did.

#### *Micro-simulation of program participation*

Using the estimated logistic equation, the actual UI regional unemployment rates, and the hypothetical UI region unemployment rates, along with the actual values for all other explanatory variables, we have calculated two sets of program-participation probabilities for all firms (including all participants and members of the comparison group). The first set shows each firm's probability of participation, with the values of all explanatory variables identical to their actual (historical) values. This may be labelled as the base-case probability. The second set is similar to the first, except that the calculation replaces the actual UI regional unemployment rates

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<sup>11</sup> The difference between the base-case and the hypothetical scenario represents the impact of the assumption on total Canadian exports. In this report, for the sake of simplification and interpretation convenience, we add this difference to the actual data of the variable in question. This procedure allows us to compare the hypothetical scenario figures directly to the historical data in level form.

with the hypothetical scenario's UI regional unemployment rates. In other words, the second set shows each firm's probability of participation under the more depressed economic conditions of the hypothetical scenario, while holding all other things constant.

Based on calculated probabilities for the two scenarios (base-case and hypothetical), we have to perform at least two random-draw simulations for each firm to determine its participation status ("in" or "not in" the Work Sharing program in 1990). The first random draw shows the firm's status in the base-case, in which the economic climate and other exogenous forces remained identical to what they were historically. The second random draw determines the firm's participation status under the circumstances of higher UI regional unemployment<sup>12</sup> (the hypothetical scenario). The same procedure is repeated for each firm in the sample. The difference of the total number of firms with the "in" status represents one *experiment's* estimated additional demand for work-sharing, induced by the more depressed economic conditions of the hypothetical economy. The results reported below are the averages of 10 *experiments*.<sup>13</sup>

Results of random-draw simulations (based on a sample of 523 firms)		
Total number of participating firms (base-case)	Total number of participating firms (hypothetical)	Difference (hypothetical - base-case)
277	302	25

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<sup>12</sup> Because of the slightly higher probability, the chance for the firm to be "in" the Work Sharing program is slightly higher in the hypothetical scenario than in the base-case.

<sup>13</sup> The random draw process is such that a participating firm may or may not be classified as "in" the Work Sharing program; similarly, a non-participant is not necessarily out of the program in the *experiment*. Since the final tabulation compares the simulated figures of the two scenarios (base-case and hypothetical), this lack of perfect fit should not present an interpretation problem. The errors are random, and should be cancelled out in the process of calculating the *differences*.



The simulated figure for the base-case under-estimates the actual number of participants in 1990 by 12 firms (an error of 4 percent). Since the estimated logistic equation cannot be expected to predict the probability of participation perfectly and the random-draw experiments have been conducted only 10 times, the *goodness of fit* appears to be acceptably close.

The simulation results suggest that under the influence of a worse economic climate, as specified by the hypothetical scenario, the demand for work-sharing participation would have been 9 percentage points higher than it was in 1990. Since the results reported are based on a sample of 289 participating and 234 non-participating firms, we have to mark-up the total number of participating firms (Work Sharing applications approved) in 1990 by 9 percent to yield an estimate of participating firms that would be applicable to the total economy. That is,

$$\begin{aligned} &\text{hypothetical scenario: number of participating firms, total economy, 1990} \\ &= 6,297*(1+0.09) = 6,873, \end{aligned}$$

where “6,297” is the actual total number of Work Sharing applications approved in 1990. In other words, if the expansion phase of the 1980s business cycle ended earlier as specified, 576 more firms would have participated in the Work Sharing program in 1990. (See Figure 3.)

This estimate should, however, be taken as an illustrative example rather than a definitive answer. First, aside from the imperfection of the econometric and simulation techniques, the analysis is based on a relatively small sample size and the data were not originally collected to test the sensitivity of work-sharing demand to economic activity fluctuation. In the future, evaluators should probably take the demand dimension as an integral part of the evaluation framework and revisit this topic. Second, the estimate depends directly on the degree of activity slowdowns created by the macro model simulation. The deterioration outlined in the hypothetical economy is only one of the many plausible scenarios. A different hypothetical scenario would, of course, yield different results.



### *Costs and impacts on the UI Account*

There are at least three remaining questions that we should attempt to answer. What is the cost of the additional demand for work-sharing? What is its impacts on the UI Account? How would the government have reacted to the additional applications for the Work Sharing program?

From the administrative data, we know that a participating firm in 1990 cost the government an average of 9,798 dollars. This figure, which is the ratio of the total Work Sharing expenditures in 1990/the number of applications approved in 1990, is only the short-run book value; it does not take into account the addition of UI benefits paid to Work Sharing workers who were laid off in the post work-sharing period.<sup>14</sup> From this average cost, we may approximate the cost of the additional demand for program participation in the hypothetical scenario as follows:

- (i) Estimated cost of additional demand =  $\$9798 \times 576 = \$5.644$  million.<sup>15</sup>
- (ii) Work Sharing program expenditure in 1990 = \$61.7 million.
- (iii) Total UI expenditure in 1990 = \$14,355 million.

$$\text{Ratio A} = 100 \times (\text{i}) / (\text{iii}) = 0.039\%.$$

$$\text{Ratio B} = 100 \times (\text{ii}) / (\text{iii}) = 0.429\%$$

$$\text{Ratio C} = 100 \times [(\text{i}) + (\text{ii})] / (\text{iii}) = 0.469\%.$$

In 1990, the total Developmental Uses of UI Funds Expenditure (UIDU) was substantially below the maximum of 15 percent allowed by law (Bill C-21). Work Sharing expenditure in this year accounted for less than 18 percent of the total UIDU expenditure. These statistics, along with the fact that Work Sharing was a relatively small program option (see the calculated ratios above),

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<sup>14</sup> See Employment and Immigration Canada (1993)

<sup>15</sup> Figure 4 presents the estimated cost of additional demand for work-sharing pictorially.

suggest that the government could have easily absorbed the additional demand for work-sharing of the hypothetical scenario by either increasing the Work sharing budget slightly without changing the expenditures of other UI program options or by a minor re-allocation of UI funds while keeping the total UI program expenditure of 1990 unchanged.

#### *Government's response to the demand for work-sharing*

Figure 5 Shows the relationship between the unemployment rate and Work Sharing applications approved. The correlation between them is positive but statistically insignificant. (The simple correlation coefficient for the variables equals 0.53, which is not even statistically significant at the 10 percent level.<sup>16</sup>) Figure 6 presents the graph for the change in the unemployment rate<sup>17</sup> and Work Sharing applications approved. It becomes obvious that the two variables are closely correlated with each other. The simple correlation coefficient is 0.90, which is statistically highly significant. As contended earlier, firms' demand for work-sharing is related to the change in economic activities rather than the level of activities. In this examination of the aggregate time series, we have found other indirect, circumstantial evidence to support this contention.

If the "Work Sharing applications approved" series is interpreted as the locus of the equilibrium points between the demand for and supply of work-sharing with the government adopting a 100 percent accommodative policy,<sup>18</sup> then the data should reflect the demand and supply information equally well. The existing data seem to suggest that government's policy has been quite "accommodative". In 1982-83, the average change in the unemployment rate was 2.18 percent, the average number of applications approved was 8,009 per annum. In 1984-89, a period of uninterrupted economic expansion, the average change in the unemployment rate was -0.733

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<sup>16</sup> We have only 10 observations for this calculation.

<sup>17</sup> That is, the first difference of the unemployment rate,  $URATE_t - URATE_{t-1}$ .

<sup>18</sup> This assumes that the government usually approves all legitimate applications for work-sharing participation.

percent, and the annual average of applications approved declined to 2,573 firms. In 1990-91, the change in the unemployment rate became positive again (the average change was 1.42 percent), the number of work-sharing applications climbed to 8,613 per annum. This sensitivity to changes in the unemployment rate suggests that had the economic climate in the late 1980s become worse than it actually was, the government could have probably absorbed the additional demand. It would be unlikely that the government wanted to increase its total UI expenditure in 1990. Re-directing UI funds from other program activities to Work Sharing would have involved "trade-offs". The government would be willing to do so if the benefits from such a policy action were more than enough to off-set the benefits forgone from the reduction of other program activities. This is an interesting but difficult evaluation assignment by itself, and is beyond the scope, time and resource constraints of the present study.

Meltz and Reid (1983) and Pal (1983) note that the Canadian government's interest in work-sharing has risen and fallen with changes in the unemployment rate. They argue that, instead of implementing policy on the basis of careful long-run planning, the use of the program as an *ad hoc* response to the crisis of rising unemployment obviously leaves a lot to be desired. Their observation on the sensitivity of Work Sharing applications approved to changes in the unemployment rate has been quite accurate. In recent years, the sensitivity seems even higher. However, their criticism of the government's accommodative approach may have been too harsh. One would expect that the Work Sharing program, especially Work Sharing as a passive policy measure<sup>19</sup>, should always be responsive to the demand of firms. Whether or not the program could have played a more active role in the Canadian labour market is a moot question. Not only has France's experience of using work-sharing as an active policy (job creation) not been convincingly successful; the relatively small size of the Canadian Work Sharing program does not such suggest that it has the potential of creating a large number of jobs. Given the existing fiscal stance of the government, expanding the program for the sake of testing out the effectiveness of work-sharing as a job creation policy must be rated as one of the most unlikely

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<sup>19</sup> For a discussion on active and passive work-sharing, see Tremblay (1989).

events in the foreseeable future.

#### **IV. Concluding observations**

In the last decade in North America, corporate restructuring has imposed some alternatives to conventional working time arrangements. The increased use of non-standard forms of work, including part-time work, contract and out-sourcing work, is associated with such restructuring in the context of competitive cost reduction. At the same time, the Canadian unemployment rate increased dramatically to a 9.5 percent average in the 1980s and the 1990s.

Policy responses to the growth of non-standard work are now just emerging, starting with the changes in the Canadian employment insurance scheme to make eligibility for benefits based on hours, not weeks. An hours-based system better reflects current work patterns, particularly the rise in part-time and multiple job hours.

The other major insurance policy response is the Work Sharing program which, in its current design, is clearly a counter-cyclical measure to enable firms to hoard labour or for workers to share unemployment during downturns. In its design, the program is not available to subsidize corporate restructuring. Two formal evaluations of this program have shown that Work Sharing does make a difference in averting layoffs and, despite being more expensive to the UI Account than straight layoff benefits, the economic and social benefits accruing to participating firms and workers more than offset the program costs. This paper extends the evaluation work by looking specifically at the relationship between changes in economic activities and the demand for Work Sharing.

To examine this relationship, a micro-simulation of work-sharing demand was conducted based upon the special survey, administrative data, and a macroeconomic model simulation of economic activity fluctuation. In a full-system macro simulation, a 10 percent reduction of Canadian exports of non-manufacturing/ non-mining products and exports of automobiles and



auto parts in 1987-90 would result in a 1.5 percentage point increase in the unemployment rate by 1990. This change in declining economic activity would increase work-sharing participation by 9 percent, at a cost of an additional \$5.6 million in 1990 to a \$14.35 billion UI Account for that year. Within the existing legislative and regulatory framework, an increased demand of work-sharing could easily have been absorbed. The 1993 evaluation results suggest that such additional expenditures are cost-effective.

This value added, of course, is documented for the program as it currently operates. The present policy debate concerns how work-sharing might be extended under current rules but also what it might be, using work-sharing in an aggressive redesign of working time or under different rules for active job creation purposes. Suggestions have been made by both policy makers and academics that Work Sharing agreements might see UI premium reductions provided that the firm create and finance new jobs to compensate for the reduction in working time of designated employees or to replace workers who accept early retirement. Under these circumstances, work-sharing may create job opportunities for youth and other unemployed groups back-filling designated positions.

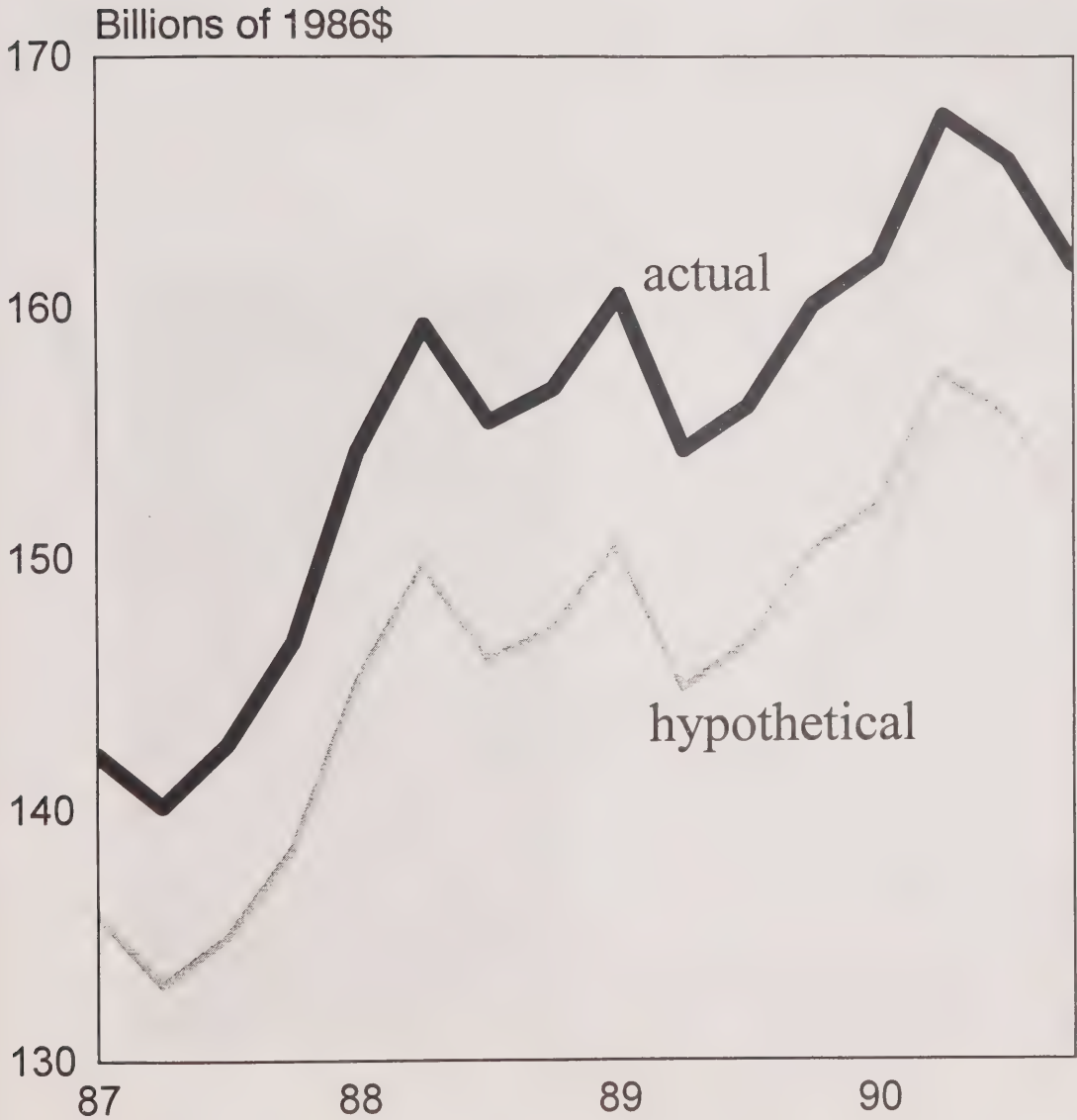
This paper does not address this policy debate directly. What it shows clearly is that work-sharing is sensitive to the change rather than the level of economic activity, and that the probability of work-sharing participation is higher among firms with higher-level skilled workforces.

However, job creation stimulation is more common at the entry skills level. This suggests that the present program is limited in its potential as a job creation initiative for at least two reasons. Even if work-sharing is a good investment, as the evaluation results show, the cost of providing it to all potential layoff situations may be prohibitive. This paper shows that an increased demand for work-sharing can be accommodated as a relatively small program option under Unemployment Insurance Developmental Uses (UIDU). In the current fiscal environment, it is difficult to imagine a proactive use of work-sharing as a job creation mechanism without finding



new monies or at least re-profiling UIDU expenditures at the expense of the other two major UIDU activities — UI-sponsored Training and Job Creation partnerships. Finally, this paper raises some questions about the appropriateness of work-sharing as a job creation stimulus directed at firms more interested in maintaining a high skilled workforce. Policy makers would need to take this present feature of work-sharing participation into consideration if they were to redesign work-sharing as both a job maintenance and job creation program. Before embarking upon this, however, it would be instructive to study more closely the work-sharing experience in France in the 1980s and the reasons why the program reverted back from a job creation initiative to an employment maintenance scheme.

Figure 1  
Canadian exports, 1987-90  
(actual and hypothetical)



**Figure 2**  
**The unemployment rate, 1987-90**  
**(actual and hypothetical)**

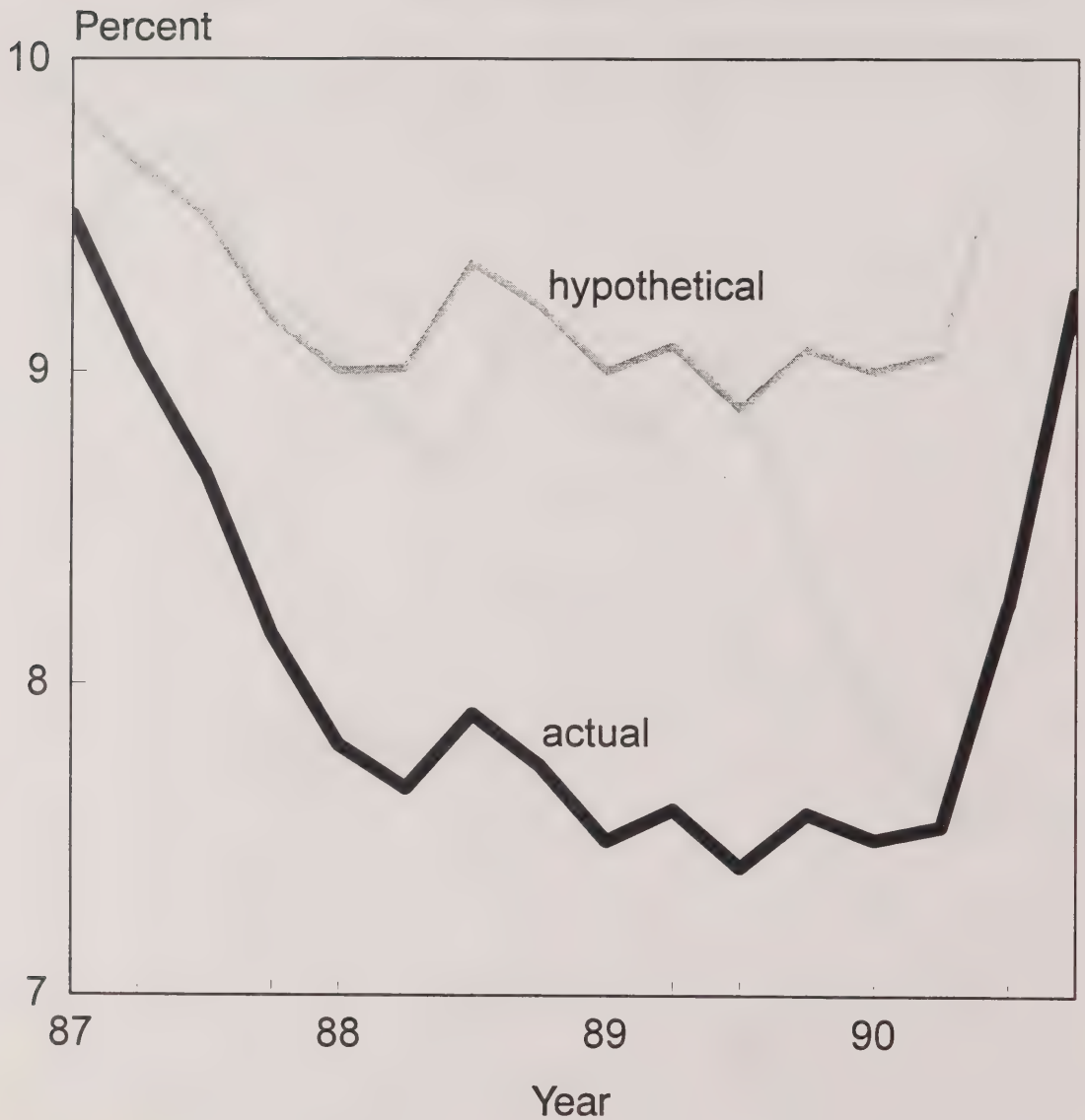


Figure 3  
Number of firms in the Work  
Sharing program, 1990  
(actual and hypothetical)

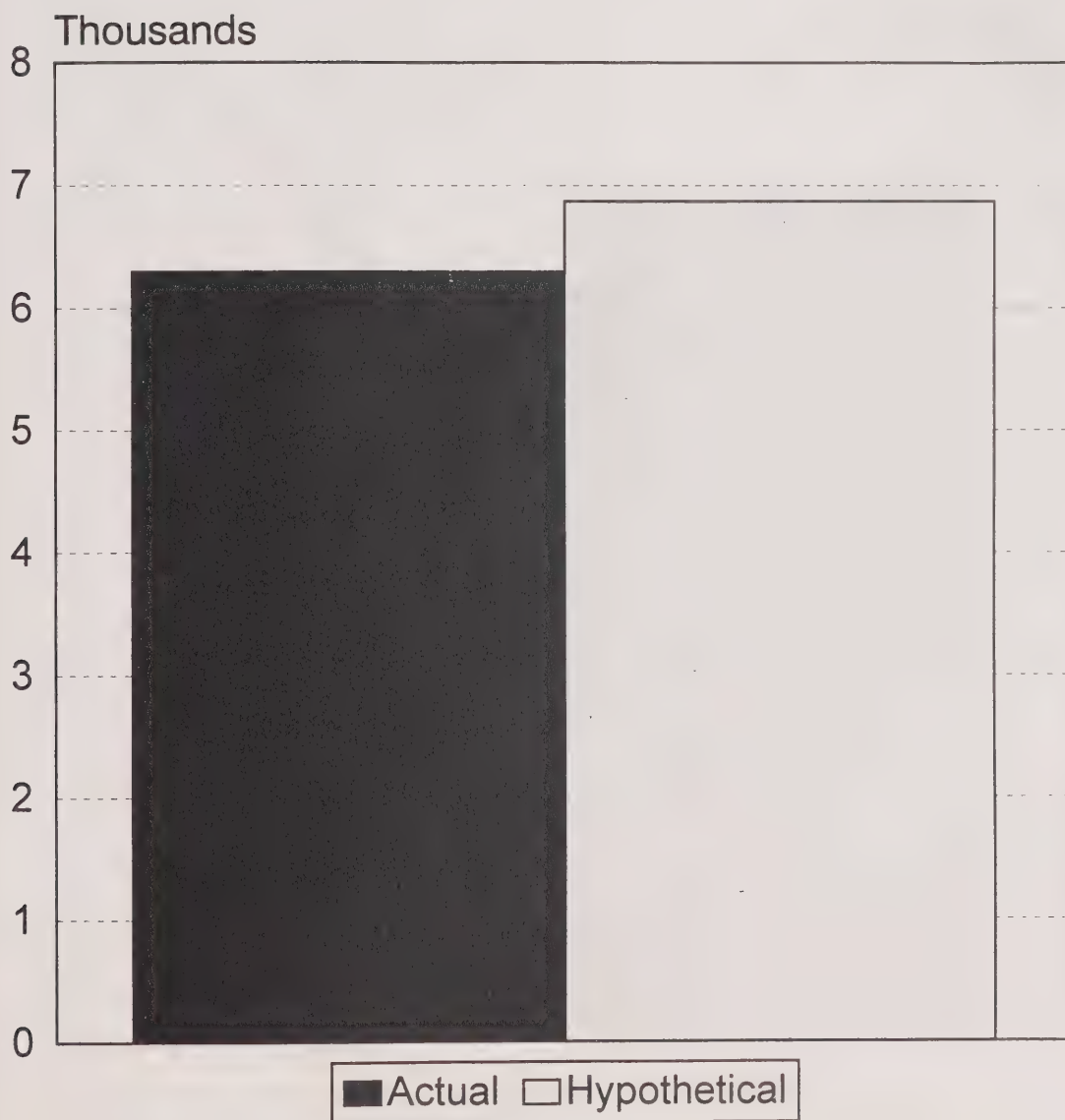


Figure 4  
Work Sharing program expenditures, 1990  
(actual and hypothetical)

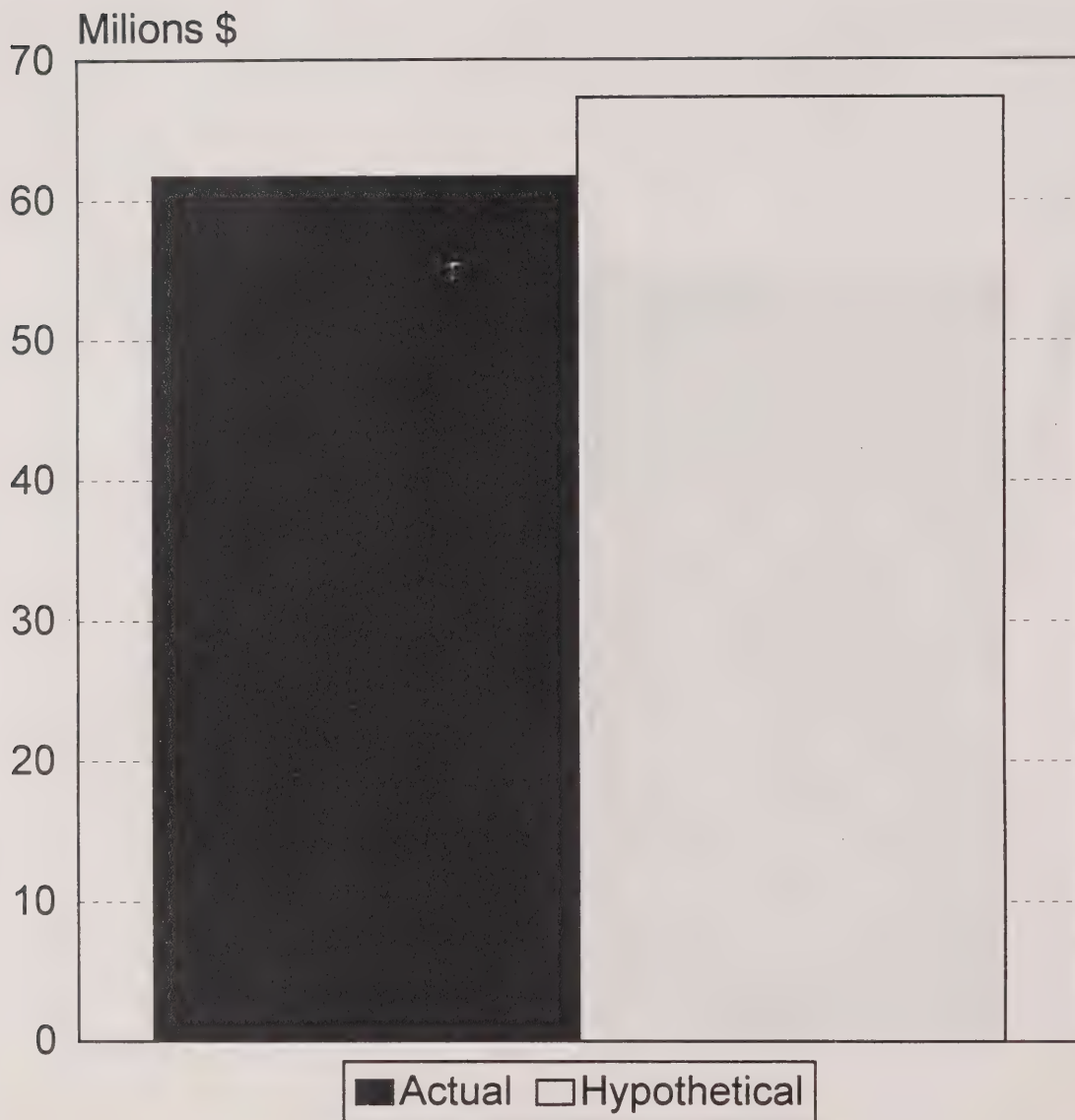




Figure 5  
The unemployment rate and work-sharing applications approved

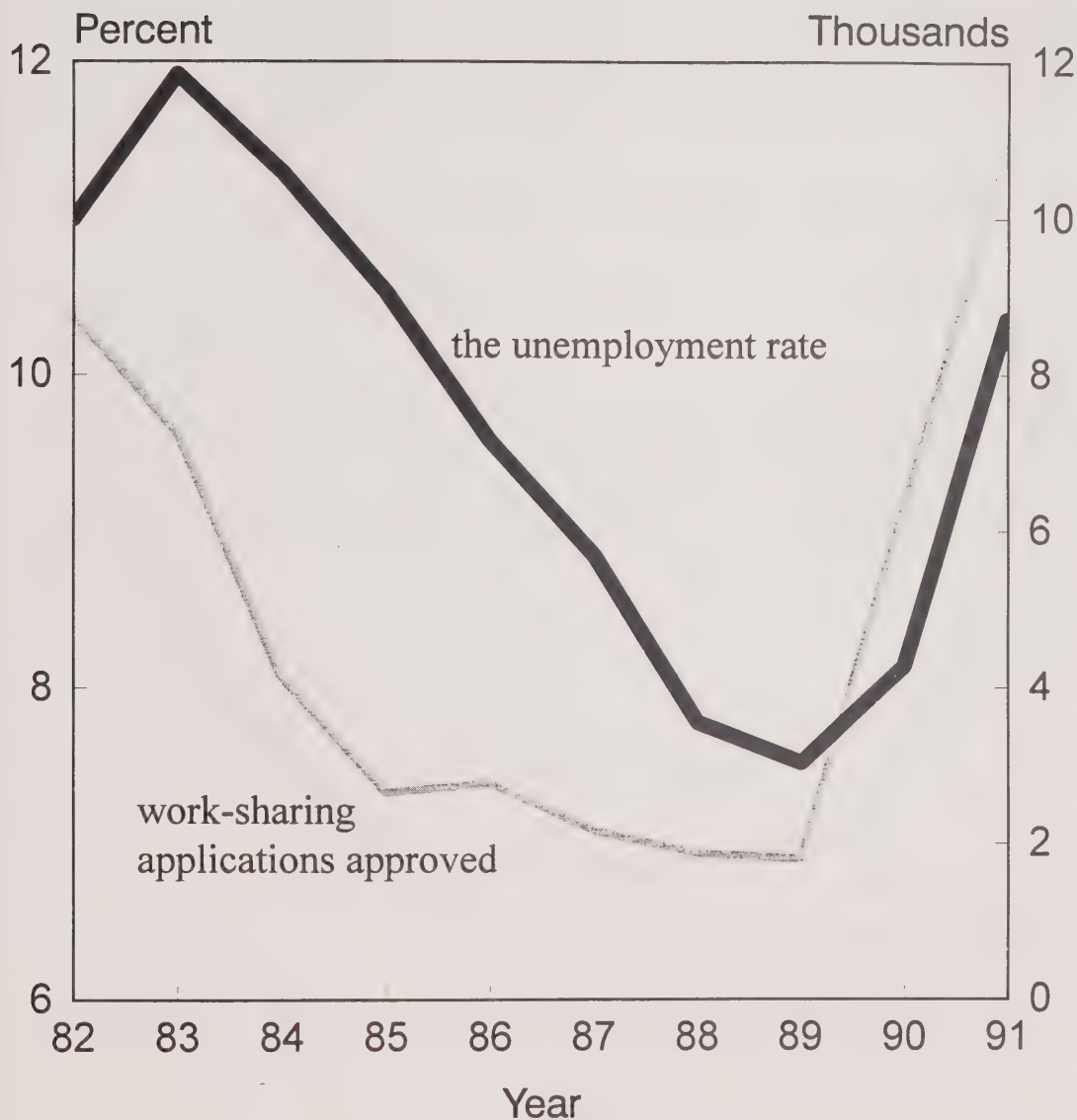
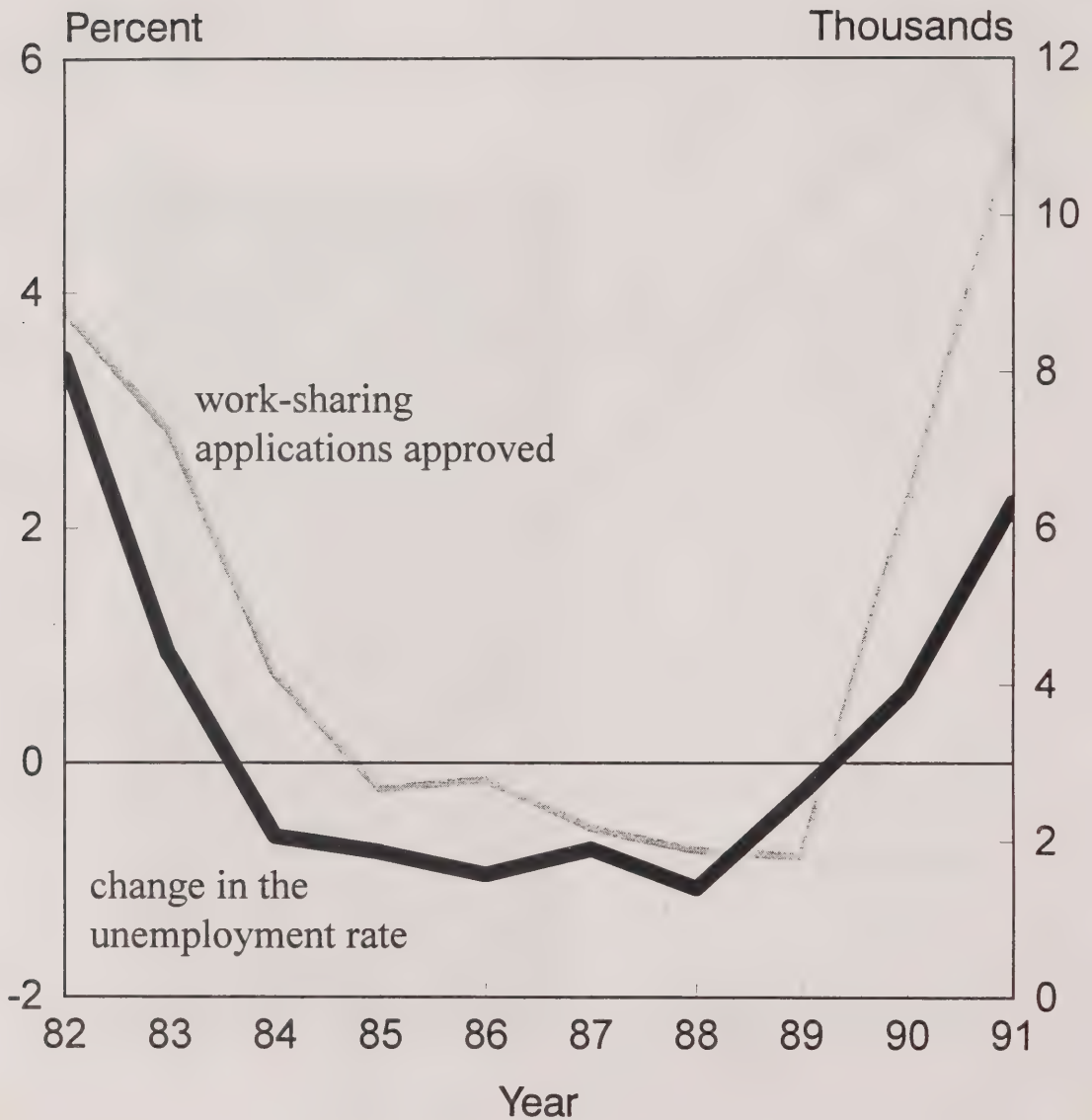


Figure 6

Change in the unemployment rate and work-sharing applications approved



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## **Session 2B (ii)**

### **The Employment Patterns of Women Following Childbirth**

William Even, Miami University, Ohio, and  
David Macpherson, Florida State University

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**CHILDREN'S EFFECTS ON WOMEN'S LABOR MARKET  
ATTACHMENT AND EARNINGS.**

June 1996

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## 1. Introduction.

Economic explanations of sex differentials in the labor market often rest upon the fact that women are more likely to exit the labor market than men. As numerous studies have demonstrated, childbearing is an important reason that women exit the labor market. Over the past 20 years, the effect of children on women's labor market attachment has diminished considerably. For example, the percent of women exiting work after having a child dropped from 58 to 24 percent between 1976 and 1995.

This study's first objective is to document the changing pattern of women's labor force exits over the past 20 years, particularly as it relates to childbearing. The analysis reveals a dramatic decline in exit rates among women -- particularly among married women with infants.

The second objective is to determine why this dramatic decrease in exit rates occurred. Among the explanations explored are increased education, earnings, and a movement of women into occupations where labor force attachment has a larger return. The results reveal that, despite a wide range of available information on standard labor supply variables, very little of the decrease in exit rates can be accounted for. Alternative explanations for the decline in exit rates are discussed.

The final objective of the study is to test an important prediction of the economic theory of sex differences in the labor market -- namely, if the impact of children on labor force attachment has diminished over time, their indirect effect on wages should be decreasing as well. There is strong evidence in support of this proposition.

## 2. Background.

The fact that women have more frequent career interruptions than men is the foundation for two well established economic theories of male-female wage differentials. According to the human capital theory, the fact that women are more likely to withdraw from the labor force than men results in several gender-related differences that lead to lower wages among women. For example, women will accumulate less human capital through labor market experience and be less willing to invest in training (general or specific) since the return on such investments is reduced by a higher quit rate. Also, given their higher quit rates, women may select into occupations that impose a lower penalty for an interruption. For example, women may choose jobs in which skills depreciate slowly during a period out of the labor force and jobs with less firm specific training.

A higher quit rate among women will also reduce their wages if employers practice statistical discrimination. According to this theory, sex-related differences in quit rates lead employers to discriminate against women if there are hiring or training costs that make quits costly to the employer.

Since these two theories imply that continuity of employment is an important determinant of wages, the relative constancy of the male-female wage gap as labor force participation rates increased rapidly between 1950 and 1980 was initially viewed as evidence against the theories. However, several studies note that rising female labor force participation does not necessarily generate an increase in the continuity of women's employment. That is, for example, suppose that 30 percent of the women work 100 percent of the time. If there is an increase in labor force participation among women that work less than 100 percent of the time, the average degree of continuity among women will fall.



Several studies document that increased employment continuity did not always accompany rising labor force participation rates. For example, Goldin (1989) shows that the average work experience of employed married women did not change substantially since 1920 despite the fact that the labor force participation rate of women increased seven fold. Also, O'Neill (1985) finds that average tenure of working women fell during the 1960s and early 1970s as labor force participation rates rose.

Since the mid-1970s, women's labor force continuity has improved. O'Neill and Polachek (1993) report that working women's labor market experience has been rising since the mid-1970s, thus contributing to a narrowing of the wage gap during the 1980s. Also, Shaw (1994) finds that the degree of persistence in young women's hours worked has increased over time.

Among employed women, the probability of a career interruption rises substantially around childbirth. Furthermore, Shapiro and Mott (1994) demonstrate that employment behavior surrounding a woman's first birth is an important predictor of labor market behavior 15 to 20 years into the future. Thus, examination of trends in women's employment behavior surrounding childbirth provides an important forecast of future labor market attachment and the direction of sex-differences in earnings and occupations.

Among studies that focus on the impact of children women's labor supply, an important issue is whether the model conditions on prior labor supply behavior. For example, while Klerman and Leibowitz (1994) examine the labor supply behavior of all women with a child less than a year of age, Even (1987) restricts his analysis to women that were working during pregnancy.<sup>1</sup> Nakamura and Nakamura (1994) discuss the desirability of conditioning on prior labor supply. They make the argument that, in cases where prediction accuracy is paramount,

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<sup>1</sup> Other studies of women's employment behavior surrounding childbirth include Leibowitz, Klerman and Waite (1992a, 1992b) and Klerman (1990).

prior labor supply and child status variables should be included in the model since they control for unobserved differences in "tastes for work".

Whether labor supply models should be conditioned on prior labor market experience depends largely on the investigator's objective. For example, if the objective is to determine whether employers should practice statistical discrimination against women, it can be argued that the relevant labor supply equation conditions on prior employment. That is, when an employer is deciding whether to invest in the training of a woman, the key statistic is not the percentage of all women that work, but rather the probability that a working woman will exit the labor force. If the objective is to determine how certain factors will influence the number of women working, it makes better sense to estimate an unconditional labor supply model. That is, for example, if the objective is to determine how an increase in real wages will affect the size of the labor force, it is essential to determine how the increased wages will affect the labor supply of all women -- not just those currently working.

In this study, focus is placed on employment following childbirth among women that worked in the year prior to the birth. In this sense, the study is an analysis of conditional labor supply. There are two reasons for the emphasis on employment following childbirth. First, childbirth is one of the most important reasons that women withdraw from the labor force early in their careers. Second, as noted by Shapiro and Mott (1994), employment following childbirth is a very strong predictor of future labor market attachment.

The study adds to the literature in several ways. First, it is the only study to examine trends in conditional employment following childbirth over the past 20 years. Second, it is the first to attempt to account for the tremendous increase in labor market attachment that has occurred. Finally, it examines whether the predictions of human capital and statistical

discrimination theories are borne out in terms of changing wage patterns predicted by the decline in women's exit rates.

### 3. The Data.

The data for the analysis are drawn from the March Current Population Survey (CPS) for the years 1976 through 1995.<sup>2</sup> The sample is restricted to civilian women aged 21 to 40 in the week of the survey. We exclude women under age 21 because of the complications that arise from school attendance and employment. We exclude those over age 40 to focus on women in their childbearing years.

An advantage of the March CPS data is that it includes information on employment status in the week prior to the survey and also asks a variety of questions about employment and earnings in the prior year. Thus, it is possible to examine employment transitions by comparing employment status last year with employment in the week prior to the survey. For the analysis, anyone that reports more than one week of employment in the prior year is defined as employed last year. Anyone that reports that they worked in the week prior to the survey or is on leave (paid or unpaid) is defined as employed this year.

### 4. Trends in Women's Employment.

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<sup>2</sup> There are two reasons that we did not include years prior to 1976. First, the earlier data provides less information on household relationships and makes it difficult to match mothers with children in many cases. Second, the earlier data has categorical responses on weeks worked in the prior year making it impossible to construct a realistic estimate of the hourly wage.

In figure 1, the percentage of 21 to 40 year old women employed is presented for the years 1976 through 1995. Over the period, the employment rate rose from 53.8 to 70.2. The growth in the employment rate has subsided over the past 10 years. Whereas it rose at an average of 1.2 percentage points per year between 1976 and 1985, average growth was only 0.4 percentage points per year since 1985.

Employment rates by child status are presented in figure 2. There are several notable points. First, employment rates are highest among women without children and lowest among women with infants (defined here as a child less than one year of age). Second, the differences in employment rates according to child status fell dramatically over time. For example, the employment rate of women with an infant rose 30.7 percentage points (from 22.4 to 53.1) percent between 1976 and 1995. Among women with no children, the employment rate rose only 4.4 percentage points (from 77.4 to 81.8). For women whose youngest child was more than one year old, the increase in the employment rates lies between these extremes.

Figure 3 presents employment rates by marital status. Consistent with the fact that the greatest increase in employment has occurred among women with children is that employment rates are rising more rapidly among married than never married women. The rate of growth in previously married (i.e. divorced, widowed, or separated) women's employment rates lies between these two extremes. Between 1976 and 1995, the employment rate rose 21.6 percentage points (from 47.7 to 69.3) among married women; rose 7.0 percentage points (from 63.5 to 70.5) among previously married women; and fell by 0.3 percentage points (from 72.3 to 72.0) among never married women. It is likely that the greatest growth in employment rates among married women is related to the fact that employment has risen most among women with young children.



## 5. Trends in Exit Behavior.

The evidence on employment rates makes it clear that the percentage of women employed has increased dramatically over time, particularly among women with young children. This does not, however, necessarily imply that there has been an increase in women's labor force attachment. In fact, within certain limits, it is possible to have a simultaneous increase in the percentage of women employed and the percentage of women that exit the labor force from one year to the next.

Because the predictions of human capital and statistical discrimination models rest upon gender differences in exit rates, not employment rates, this section examines trends in exit behavior -- with a focus on what occurs following childbirth. The analysis is restricted to women that were employed in the year prior to the March survey. Among such women, two types of exits are defined on the basis of the woman's reported activity in the week prior to the survey. A "work exit" occurs if a woman reports she did not work in the week prior to the survey. An "employment exit" occurs if a woman reports that she did not work and was not on leave (paid or unpaid) from her employer. Given its more comprehensive definition, the percentage of women that exit work will always exceed the percentage that exit employment.

Figure 4 presents work and employment exits for all women aged 21-40. Between 1976 and 1995, women's employment exit rates fell 8.9 percentage points from 21.5 to 12.6, and the work exit rate fell 8.7 percentage points from 25.0 to 16.3. The fact that the absolute decrease in exit rates is virtually the same for work and employment exits suggests that the percentage of employed women that go on leave has been stable over time.



The fact that exit rates have fallen so dramatically over time among women implies that gender differences in earnings and human capital accumulation should be falling *ceteris paribus*. With greater labor force attachment, women should be more willing to seek jobs that require specific training, and employers should be more willing to hire women into such jobs. Also, with women's improved labor force attachment, differences in labor market experience between men and women should be on the decline.

Employment exit rates are presented in figure 5 by child status. Across the entire time period, exit rates are highest for women with an infant and lowest among those with no children. The difference in exit rates across groups has dropped dramatically over time, however. Whereas the exit rates of women with an infant fell 25.7 percentage points (from 57.6 to 23.9), those for women with no children fell only 5.4 percentage points (from 14.3 to 8.9 percent). For women with children more than a year old, the decline in the exit rate was somewhere between these two extremes. In general, exit rates have decreased for women with every child status examined and there has been a narrowing of differences across child status groups.

The reduced effect of children on exit rates is consistent with the convergence of exit rates across marital status presented in figure 6. In 1976, the exit rates were 24.3, 16.1 and 18.6 for married, previously married, and never married women. By 1995, exit rates had fallen for the three groups to 12.2, 13.1 and 16.5. While exit rates fell for all three groups, they fell most for married and then previously married women. In fact, whereas married women had the highest exit rates in 1976, by 1995 they had the lowest exit rates. Given that married women are more likely to be affected by childbearing, the greater decline in their exit rates is not entirely surprising. It is, however, rather surprising that married women have lower exit rates than never married women today. Given that never married women are not likely to have a partner that can generate

income when she is out of work, it is surprising that such women are more likely to exit employment.

In summary, exit rates fell dramatically over the past 20 years, particularly among women with young children and married women. The economic impetus and consequences of this dramatic change are the subject of the next two sections.

## 6. Why have married women's exit rates declined?

The standard theory of women's employment decisions rests on a comparison of market and reservation wages. A woman's reservation wage is the minimum wage at which she is willing to accept employment. A woman works if the wage rate offered in the market exceeds the reservation wage. For a woman to exit, either the reservation wage must increase or the market wage must decrease. In most circumstances, women's market wages are not likely to fall with time since on-the-job training and the accumulation of experience will naturally increase their wages. The exception occurs when there is a decrease in labor demand causing employers to cut wages. It is probably the case, however, that most working women's exits result from sudden changes in their reservation wages. For example, the birth of a child will likely increase the reservation wage and increase the likelihood that a woman exits the labor force.

An important consideration in the wage/reservation theory is the impact of human capital accumulation and depreciation. Mincer and Polachek (1974) describe the relevant wage rate as the "full wage" which includes (1) the market wage, (2) the present value of the reduction in future earnings caused by the increased depreciation of human capital during time out of the labor force; and (3) the present value of the loss in future earnings associated with the forgone

accumulation of human capital. Using this expanded definition of the relevant wage rate, other things being the same, the greater is the depreciation of wages during time out of the labor force the less likely a woman will exit. Similarly, the greater is the foregone growth in wages during time out of the labor force, the less likely a woman will exit.

There are several pieces of empirical evidence consistent with the notion that labor force withdrawals reduce earnings and that women select into occupations that penalize exits the least. Mincer and Polachek (1974) find that wage deterioration during time out of the labor force is highest for those with the highest level of schooling and in high skill occupations. Moreover, Polachek (1981) shows that women tend to select into the occupations that have the lowest atrophy rates. Light and Manuelita (1995) report that women's wages fall less than men's after a temporary departure from the labor market and that they rebound more quickly after re-entry. Also, Hirsch and Macpherson (1995) show that occupations with a disproportionate share of women tend to have less training. In general, the greater frequency of labor force exits impacts the types of jobs that women enter and their earnings growth.

Given these considerations, a model of women's exit behavior must control for several factors: the market wage, factors influencing the reservation wage, and factors that influence the impact of an exit on future wages. Possible explanations for the decline in exit rates are higher market wages, lower reservation wages, or a movement of women into jobs that have greater wage growth and/or depreciation rates.

The CPS data include information on wage rates. Several variables that are likely to influence the reservation wage are also available -- marital status, other family income (excluding transfer payments that would be endogenous to the woman's work decision), children in various

age groups, and the woman's age and race. Finally, occupation and industry controls are included to account for differences in the level of training and skill atrophy across jobs.

Since the earlier examination of trends in exit rates by marital status reveals that most of the decline has occurred among married women, it appears that separate analysis by marital status is in order. For the sake of brevity, focus is placed only on married women in this section. In work not reported here, the stability of exit rates among never married and previously married women is consistent with the observed changes in their characteristics.<sup>3</sup>

Among married women that worked in the year prior to the survey, there are several factors that may have contributed to the rapid decline in their exit rates. Average real wages (in 1995 dollars) rose from \$10.37 to \$11.57. Since children, particularly when young, generally increase the reservation wage, the decline in the average number of children from 1.6 to 1.5 may have contributed to a modest decline in exit rates. Finally, women's jobs have changed in ways that could contribute to reduced exit rates. Also, the increased self-employment of women could reduce exit rates in two ways. First, the flexibility of some types of self-employment could make it easier for women to stay at home with an infant and continue working. Also, for some self-employed workers there will be investments in capital or reputation that could drive up the opportunity cost of staying out of the labor force.

To determine the extent to which the above changes have contributed to married women's declining exit rates, a decomposition of the change in exit rates over time is performed. The comparison is made between 1976-79 (1970s) and 1992-95 (1990s) exit rates. A probit model of exit rates is estimated for 1976-79. Using the 1976-79 probit coefficients, a predicted exit rate is

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<sup>3</sup> In particular, in a probit model of exit rates, the effect of year dummies is statistically insignificant among previously married women. Among never married women, a comparison of the 1976-79 and 1992-95, reveals no significant difference in behavior. For previously married women, there is a statistically significant 2.7 percent lower exit rate in 1992-95 than in 1976-79. Among married women, the exit rate is estimated to be 7.0 percent lower in the later period.



generated for women in 1992-95. The difference in the 1976-79 exit rate and that predicted for 1992-95 is the change in the exit rate that can be accounted for by changes in observed characteristics of working women. Using the approach described in Even and Macpherson (1990), it is also possible to calculate how much of the change in exit rates can be attributed to changes in a particular explanatory variable.

Table 2 presents the estimated probit models of exit behavior for the 1976-79 and 1993-95 samples. Most of the results are consistent with expectations. Focusing on the probit model for the 1976-79 sample momentarily, the effect of children on the probability of exit is quite substantial when the child is an infant but diminishes rapidly as the child ages. A child under the age of one increases the probability of an exit by 26.7 percent. The effect drops sharply to 8.9 percent for a child aged one to two, and falls gradually to .8 percent for children aged 13-16. Children 17 and over have a statistically insignificant effect on exits.

A higher real wage has a statistically significant but diminishing negative effect on the probability of an exit <sup>4</sup>. While the effect of real wages is statistically significant at the .01 level, quantitatively the effect is quite small. At the mean value of the minimum wage in 1973-76, a \$1 increase in the real wage reduces the probability of an exit by only .03 percentage points. This effect is minuscule in comparison to the effect of young children on the probability of an exit.

The type of job held by women also has an important effect on the probability of exiting. Consistent with expectations, self employed women are 10.2 percent less likely to exit than a woman wage and salary worker in the private sector. Also, there are significant differences in the probability of an exit across industry and occupation. The differences across industry and

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<sup>4</sup> The diminishing effect is reflected in the positive coefficient on the quadratic term. The marginal effect of higher real wages does not turn positive until wages rise above \$59.



occupation could reflect variations in the cost of an exit from the labor force due to variations in training or skill depreciation rates.

Other results consistent with predictions are the fact that more educated women, who are generally believed to have more firm specific training, are less likely to exit. Also, other sources of family income increase the probability of an exit by increasing the reservation wage through an income effect.

Comparing the 1976-79 estimates with those for 1992-95 reveals a high degree of similarity. The most notable difference is that infants have a much smaller effect on exit probabilities in the 1990s than in the 1970s. Whereas an infant increased the probability of an exit by 26.7 percentage points in the 1970s, the effect fell to 10.4 percent in the 1990s.

The decomposition of the change in married women's exit rates is presented in table 3. The exit rate fell by 9.6 percentage points between the 1976-79 and 1992-95 sample. Using the 1970s probit coefficients, only 2.3 percentage points of this decline can be accounted for by changes in married women's observed characteristics. With the 1990s coefficients, 2.1 percentage points are accounted for. In either case, about one fourth of the decline in married women's exit rates can be accounted for by the long list of control variables included in the probit models.

Given the fact that childbirth is arguably the most important cause of women's exits in the labor force and that the impact has dramatically fallen over time, a focus on behavior surrounding childbirth is instructive. As in the prior section, focus here is placed upon the behavior of married women.

In table 4, a decomposition of the change in exit rates between the 1970s and 1990s sample is presented.<sup>5</sup> Of the 26.7 percentage point decline in exit rates, only 3.8 (4.2) percentage points can be accounted for by the characteristics included when using the 1970s (1990s) probit coefficients. Thus, less than one-sixth of the decline in exit rates can be accounted for by changes in observed worker characteristics.

## 7. The Implication of Greater Labor Force Attachment for Women's Earnings.

The greater likelihood of labor force exits among women is often pointed to as a cause of several gender related differences in labor market outcomes. This section investigates whether the large decline in women's exit rates has resulted in the wage effects predicted by human capital and statistical discrimination theory. In particular, the changing pattern of exit rates has implications for women's wages through their effect on job choices and the level of training received.

One important change in exit rates is that, whereas married women had substantially higher exit rates than previously married or single women in the 1970s, they have slightly lower exit rates in the 1990s. To the extent that married women and their employers incorporate this behavior into their human capital decisions, married women's investments in training should have increased. Also, whereas married women should have been more inclined to be in traditionally "female" occupations in the 1970s, this tendency should have diminished over time. Finally, as married women's investments in human capital improve and as employers practice less statistical

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<sup>5</sup> The probit estimates for the 1970s and 1990s data are not presented for the sake of brevity. Generally speaking, the pattern of results is similar to that for all married with two exceptions. First, the statistical significance of the control variables are lower when the sample is restricted to women with infants. This is undoubtedly partially due to the much smaller sample size. Second, children have a much smaller effect on exit rates when the sample is restricted to women with infants. In fact, children aged two or over have either a zero or negative effect on the exit rate of married women with infants. The fact that a two year old is associated with a lower exit rate might reflect the fact that a woman working with a two year old has a strong attachment to the labor market.

discrimination against them, married women's wages should have improved relative to other women.

Another important change in exit rates is the remarkable decrease in the effect of childbirth on exit rates -- particularly among married women. Since children have a smaller effect on the probability of an exit, their negative effect on wages should have diminished over time, especially among married women.

Table 5 presents log-wage regressions that for the 1970s and 1990s. In the first two columns, estimates are presented for all women aged 21-40. Consistent with the hypothesized effect, the impact of children on wages has diminished over time. Whereas each child reduced wages by 3.4 percentage points in the 1970s, the effect had fallen to 2.5 percent by the 1990s.<sup>6</sup> Consistent with the dramatic reduction in married women's exit rates relative to single and previously married women is the fact that married women's wages have increased relatively. In the 1970s, married women had slightly higher wages (.009) than other women, though the difference was statistically insignificant. By the 1990s, married women earned 4.6 percent higher wages than other women, and the difference is statistically significant at the .01 level.

In columns 3-8 of table 5, log-wage regressions are presented for married, never married, and previously married women separately. Since the effect of children on exits has dropped most for married women, the negative effect of children on wages should have fallen most for married women. The results are consistent with this hypothesis. Among married women, the marginal effect of children on wages fell from 3.1 percent in the 1970s to 1.6 percent in the 1990s. For previously married women, there was no statistically significant change in the marginal effect of children on wages over time. Among single women, there was a statistically significant increase

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<sup>6</sup> The t-statistic for equality of the coefficients on number of children is 2.99. Thus, there is a statistically significant difference in the effect of children on wages in the 1970s and 1990s.

in the negative effect of children on wages.<sup>7</sup> Thus, the negative impact of children on wages has diminished only for married women. This is consistent with the fact that exit rates following childbirth fell most among married women.

Part of the reason that children should have a smaller negative effect on women's earnings in the 1990s than the 1970s is that childbearing is less likely to reduce women's labor market experience or sever ties with an employer. Another part of the explanation is that children should have a smaller effect on occupational and industrial choices. That is, if women are less likely to interrupt their careers when they have children, they should be more inclined to select into occupations and industries with training investments.

To the extent that the measured effect of children on wages is capturing tenure, occupation, and industry effects, the estimated coefficient on children should diminish as these variables are added to the wage equation. Moreover, given that the evidence from exit equations suggests that the link between children and these labor market characteristics has diminished over time, the addition of these variables to wage equations should reduce the estimated child effect more in the 1970s than the 1990s.

To investigate these issues, another data source is required since the March CPS has no information on employee tenure or experience. The May 1979 and April 1993 CPS have virtually the same wage and labor market information as the March surveys with additional information on employee tenure. Unfortunately, however, no information is available for total labor market experience.

In table 6, the estimated effect on number of children on wages is presented for four specifications. All four include numerous employer and employee characteristics and the number

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<sup>7</sup>The t-statistic for testing the null hypothesis of equality coefficients on number of children in the 1970s and 1990s is 2.09 for never married women. Thus, the null is rejected at the .05 level.



of children in the family. In the first specification, tenure, occupation, and industry controls are excluded from the regression. In the second through fourth specifications, these controls are added separately and then jointly to determine how much of the reduced children effect is due to the fact that children have smaller effects on tenure and industrial or occupational choice. The regressions are estimated separately by marital status and by year.

Consistent with the results from the March CPS data, the effect of children on wages fell across time for all women, married and previously married women -- regardless of whether tenure, industry or occupation are controlled for. Also, as in the March CPS, the negative effect of children rose over time for never married women.

Comparing the four specifications for a given sample reveals that part of the explanation for the declining effect of children on wages is their reduced correlation with tenure, occupation, and industry. For example, in the regression for all women, the coefficient on children dropped .018 between 1979 and 1993 when tenure, occupation, and industry are excluded from the model. When these additional controls are added, the coefficient on children drops only .011 between 1979 and 1993. Thus, the reduced effect of children on wages over time is partly because children have less effect on women's tenure and on their inclination to select into low wage occupations or industries.

The results by marital status reveal a similar pattern for married and previously married women. Without controls for tenure, occupation or industry, the coefficient on children drops .019 and .033 among married and previously married women. With these controls added, the coefficients drop .009 and .019. Thus, the changing relationship between number of children and these labor market characteristics (tenure, occupation and industry) account for an important share of the declining effect of children on wages.



For never married women, the negative wage effect of children has grown over time, but the increase in the coefficient is smaller when tenure, industry, and occupation are controlled for. This seems to suggest that, in contrast to the case for married and previously married women, the adverse effect of children on labor market characteristics has worsened over time among never married women.

## 8. Summary and Conclusions.

This study documents the dramatic decline in women's exit rates that has occurred since 1976 and shows that the declines have been most pronounced among married women with young children. A model of married women's exit behavior was estimated as a function of labor market characteristics and factors that could influence the value of time in the home. The statistical model of exit behavior was used to determine how much of the change in married women's that occurred between the 1970s and 1990s could be accounted for by changes in observed characteristics. Less than one-fifth of the decline in exit rates can be accounted for by changes in observed characteristics. This is true for the exit behavior of all married women, and for women with a child less than one.

The fact that changing labor market characteristics account for so little of the decline in exit rates leads to a natural question -- what has caused the decline that is not included in the model? A simple response is that "social norms" have changed and women now find it more acceptable to work when they have young children. Testing this hypothesis is rather difficult, however. Before abandoning the neoclassical economic explanations, there are several additional avenues that might be explored. First, rising divorce rates may increase married women's desire

to establish a career. In support of this argument, Johnson and Skinner (1986) find that higher divorce probabilities increase married women's labor supply. An advantage of this explanation is that it is consistent with a greater decline in married women's exit rates than single or previously married women's exits.

A second possible explanation for the rapid decline in married women's exit rates is that there may be a compounding effect of a decrease in exits. Namely, if married women's exit rates fall, statistical discrimination against women diminishes and women can move into jobs with greater training investments. As they move into such jobs, the cost of an exit is increased. The difficulty in empirically testing this hypothesis is that training investments are difficult to measure.

Given that the exit rates of married women fell more than never or previously married women, human capital and statistical discrimination theory predict that married women's wages should have risen relative to others. This prediction is supported in the wage analysis. Furthermore, since children have a much smaller effect on exit rates in the 1990s, theory also predicts that the effect of children on wages should diminish over time. This hypothesis was tested and supported with two separate data sources. In both cases, the negative effect of children on wages has diminished over time. The analysis also reveals that part of the reason that children have a smaller negative effect on married and previously married wages is that the negative relationship between children and "wage enhancing" labor market characteristics (as measured by tenure, occupation, and industry) has diminished over time.

In general, the predictions of human capital and statistical discrimination theory are borne out by the empirical analysis. As women's exits have fallen, their wages have grown. Moreover, as the effect of children on exits fell, their effect on wages have dropped as well. Finally, the

sub-groups of women whose exit rates fell the most have generally experienced the greatest wage growth since the 1970s.

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Table 1: Sample Means for Married Women Aged 21-40 Who Were Employed in the Prior Year.

Year	Years of Education	% with a college degree	% Self-employed	Number of Children	Sample Size
1976	12.66	17.97	3.49	1.61	7,952
1977	12.73	18.77	3.89	1.58	10,047
1978	12.74	18.93	4.59	1.54	9,790
1979	12.83	19.38	4.44	1.52	10,481
1980	12.88	19.8	4.85	1.49	12,683
1981	12.91	19.34	5.29	1.47	12,627
1982	12.97	20.56	5.5	1.47	11,367
1983	13.09	22.09	5.54	1.41	11,405
1984	13.19	23.62	6.4	1.43	11,407
1985	13.17	22.9	5.81	1.42	11,744
1986	13.17	22.69	5.83	1.43	11,763
1987	13.22	23.23	5.97	1.44	11,872
1988	13.23	23.41	6.41	1.44	11,755
1989	13.28	25.01	6.12	1.44	11,020
1990	13.29	25.07	6.21	1.45	11,736
1991	13.35	25.58	6.38	1.46	11,372
1992	13.33	24.46	6.35	1.46	11,192
1993	13.44	25.98	6.12	1.46	10,951
1994	13.51	26.06	6.72	1.47	10,282
1995	13.55	26.89	7.31	1.46	10,097

Table 2: Probit Estimates of Exit Model for Married Women Aged 21-40.

	<u>1976-79</u>		<u>1992-95</u>	
	<u>dp/dx</u>	<u>t-statistic</u>	<u>dp/dx</u>	<u>t-statistic</u>
Intercept	0.05	1.38	-0.07	-2.72
Number of Children of Age:				
<1	0.27	39.43	0.1	23.04
1	0.09	11.52	0.04	7.67
2	0.05	6.62	0.03	7.21
3	0.04	6.14	0.02	5.07
4	0.04	5.36	0.02	4.94
5	0.03	3.76	0.02	3.78
6-7	0.02	4.68	0.02	4.63
8-9	0.02	3.35	0.01	1.41
10-13	0.01	2.29	0	0.39
14-17	-0.01	-1.43	0	0.45
Education:				
HS Graduate	-0.03	-4.95	-0.04	-6.26
Some College	-0.03	-3.78	-0.04	-6.15
College Graduate	-0.04	-4.2	-0.04	-5.1
Race:				
Black	-0.06	-6.73	0.01	1.37
Other Nonwhite	-0.02	-1.57	0.01	1.24
Real Wage	0	-9.24	0	-10.66
Real Wage Sq/100	0	10.93	0	12.03
Other Income/100	0.08	3.13	0	-0.15
Other Income Sq/100	0	1.93	0	3.91
Parttime	0.08	16.78	0.08	22.37
Age:				
24-26	-0.03	-3.86	-0.03	-3.93
27-29	-0.04	-5.64	-0.04	-5.46
30-32	-0.07	-8.03	-0.05	-7.73
33-35	-0.08	-8.72	-0.06	-8.53
36-38	-0.09	-8.75	-0.06	-8.75
39-40	-0.1	-9.24	-0.07	-8.63
Public sector employee	-0.02	-2.68	-0.01	-2.2
Self-employed	-0.1	-9.02	-0.05	-7.56
Sample Size	38,270		42,522	
Scale Factor	0.28		0.18	
Log-Likelihood	-18,247.17		-14,767.78	

Notes: The partial derivatives (dp/dx) are evaluated the sample means of the independent variables. The partial derivative divided by the scale factor yields the associated probit coefficient. The model also includes controls for the amount of training required in the 3-digit occupation, 8 region, 12 occupation, and 12 industry dummies.

Table 3: Factors Contributing to Change in Exit Rates Among Married Women  
Between 1976-79 and 1992-95.

Base Year Coefficients	<u>1976-79</u>	<u>1992-95</u>
Variable:		
Children	0.43	0.22
Education	-0.28	-0.36
Race	0.02	0.01
Wage	-0.25	-0.23
Other Income	-0.1	0
Occupation	0	-0.24
Industry	0.11	0.05
Parttime	-0.09	-0.1
Region	-0.09	-0.06
Age	-1.11	-0.89
Public	0.08	0.06
Self-employed	-0.21	-0.12
Occupation Characs	-0.77	-0.46
Total Explained	-2.27	-2.14
Total Unexplained	-7.3	-7.43
Total Change	-9.57	-9.57

Table 4: Factors Contributing to Change in Exit Rates Among Married Women with a Child Under One Between 1976-79 and 1992-95.

Base Year Coefficients	<u>1976-79</u>	<u>1992-95</u>
Variable:		
Children	-0.09	-0.09
Education	-0.07	0.06
Race	-0.02	-0.05
Wage	0	0
Other Income	-0.21	0.16
Occupation	0.22	-0.66
Industry	0.18	0.26
Parttime	0.11	0.22
Region	0.2	-0.08
Age	-1.9	-2.56
Public	0.1	0.1
Self-emp	-0.52	-0.33
Occ Charcs	-1.36	-0.83
Total Explained	-3.83	-4.2
Total Unexplained	-22.89	-22.52
Total Change	-26.72	-26.72

Table 5: Log-wage regressions by marital status.

	All women		Married women		Previously married women		Never married women	
	1976-79	1992-95	1976-79	1992-95	1976-79	1992-95	1976-79	1992-95
Intercept	1.491	1.452	1.492	1.586	1.543	1.31	1.507	1.367
	38.78	41.24	30.99	33.66	13.48	12.74	18.8	21.12
Number of children	-0.034	-0.025	-0.031	-0.016	-0.035	-0.038	-0.031	-0.048
	-16.92	-11.71	-12.28	-6.11	-7.3	-7.4	-5.67	-8.53
Years of education (reference group < 12 years)								
12	0.1	0.119	0.072	0.101	0.133	0.149	0.187	0.125
	14.92	14.61	8.65	9.06	9.25	8.69	10.32	7.4
13-15	0.133	0.211	0.109	0.198	0.173	0.237	0.194	0.199
	17.4	24.82	11.11	16.86	10.25	12.96	10.45	11.64
16 or more	0.225	0.39	0.202	0.39	0.301	0.417	0.272	0.353
	24.78	41.3	17.16	30.22	12.96	17.93	13.41	19.26
Race (reference group White)								
Black	0.03	-0.04	0.051	-0.03	0.025	-0.045	-0.018	-0.049
	4.21	-5.75	4.97	-2.59	1.79	-2.98	-1.35	-4.54
Other race	0.023	-0.018	0.034	-0.033	-0.027	0.007	0.018	-0.001
	1.72	-2.11	1.99	-2.77	-0.78	0.31	0.7	-0.05
Part-time worker	0.042	-0.016	0.054	-0.002	0.07	-0.036	0.008	-0.038
	8.38	-3.34	8.6	-0.37	4.91	-2.67	0.65	-4.18
Age (reference group aged 21-23)								
24-26	0.108	0.101	0.102	0.109	0.055	0.071	0.126	0.101
	16.23	13.11	10.85	8.22	2.74	2.38	11.47	9.75
27-29	0.168	0.197	0.152	0.191	0.123	0.147	0.204	0.212
	23.82	25.25	15.96	15.06	6.29	5.19	14.6	18.06
30-32	0.195	0.261	0.171	0.253	0.151	0.192	0.272	0.286
	25.84	33.45	17.15	20.29	7.67	6.97	15.31	22.52
33-35	0.222	0.298	0.199	0.288	0.166	0.254	0.314	0.307
	27.72	37.62	19.02	23.07	8.09	9.33	14.77	21.76
36-38	0.237	0.32	0.204	0.306	0.232	0.27	0.311	0.349
	28.64	39.87	19.05	24.48	11.17	9.97	12.83	22.17



Table 5: Log-wage regressions by marital status.

39-40	0.222	0.329	0.197	0.31	0.186	0.277	0.314	0.393
	23.48	37.33	16.4	23.46	8.16	9.85	9.97	20.17
Public sector employee	-0.005	-0.041	0.002	-0.041	0.006	0.001	-0.019	-0.054
	-0.7	-5.96	0.22	-4.57	0.36	0.05	-1.46	-4.16
Self employed	-0.276	-0.18	-0.298	-0.201	-0.15	-0.126	-0.141	-0.105
	-22.9	-18.97	-21.62	-18.21	-4.43	-4.54	-3.34	-3.97
Marital Status (reference group never married)								
Married	0.009	0.046						
	1.52	8.74						
Previously married (widowed, divorced, or separated)	0.024	0.009						
	3.21	1.37						

<sup>1</sup> Wages regression also include controls for 13 occupations and 14 industries. T-statistics are presented below coefficient estimates.

Table 6: Effect of Number of Children on Wages.

<u>Model</u>	<u>All Women</u>		<u>1993</u>	
	<u>Coefficient</u>	<u>T-stat</u>	<u>Coefficient</u>	<u>T-stat</u>
No Tenure/No Ind & Occ	-0.039	-7.16	-0.021	-3.69
With Tenure/No Ind & Occ	-0.03	-5.55	-0.017	-3.04
No Tenure/With Ind & Occ	-0.031	-5.97	-0.015	-2.88
With Tenure/With Ind & Occ	-0.023	-4.52	-0.012	-2.38
<u>Married Women</u>				
No Tenure/No Ind & Occ	-0.037	-5.4	-0.018	-2.55
With Tenure/No Ind & Occ	-0.027	-4.1	-0.015	-2.18
No Tenure/With Ind & Occ	-0.029	-4.55	-0.015	-2.22
With Tenure/With Ind & Occ	-0.022	-3.41	-0.013	-1.96
<u>Previously Married Women</u>				
No Tenure/No Ind & Occ	-0.056	-4.4	-0.02	-1.82
With Tenure/No Ind & Occ	-0.046	-3.58	-0.021	-1.67
No Tenure/With Ind & Occ	-0.041	-3.43	-0.015	-1.31
With Tenure/With Ind & Occ	-0.033	-2.78	-0.014	-1.19
<u>Never Married Women</u>				
No Tenure/No Ind & Occ	-0.015	-1.01	-0.03	-2
With Tenure/No Ind & Occ	-0.014	-0.93	-0.02	-1.41
No Tenure/With Ind & Occ	-0.008	-0.56	-0.02	-1.33
With Tenure/With Ind & Occ	-0.007	-0.5	-0.01	-0.81

Notes: Data sources are the May 1979 and April 1993 Current Population Surveys. The sample is restricted to female wage and salary workers aged 21 to 40. The models also include controls for age and its square, part-time status, firm size (4 dummies), plant size (2 dummies), race (2 dummies), union coverage, education (3 dummies), and public sector status.

Figure 1: Employment Rates of Women Aged 21-40.

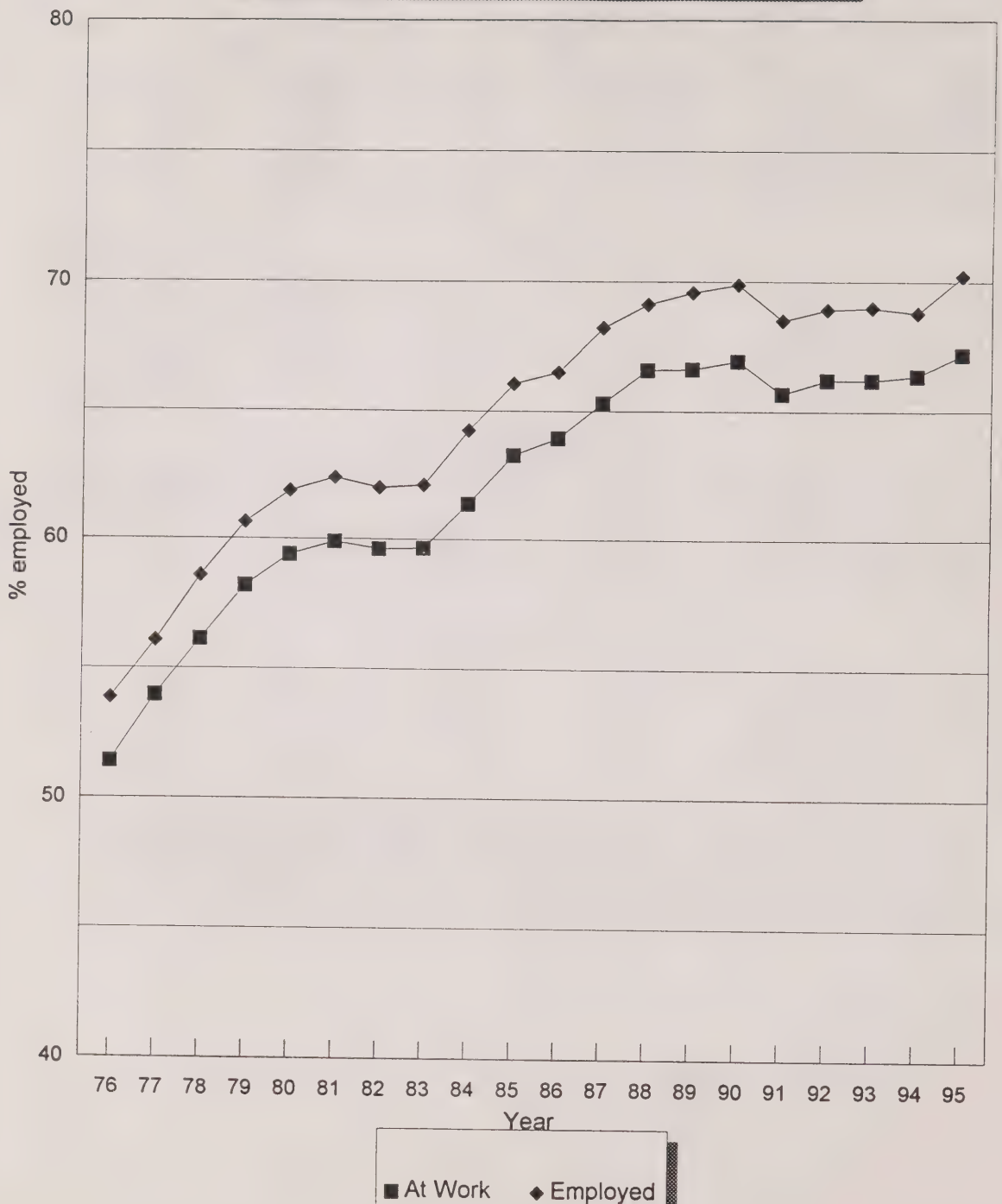


Figure 2: Percentage of 21-40 Year Old Women Employed  
by Age of Youngest Child.

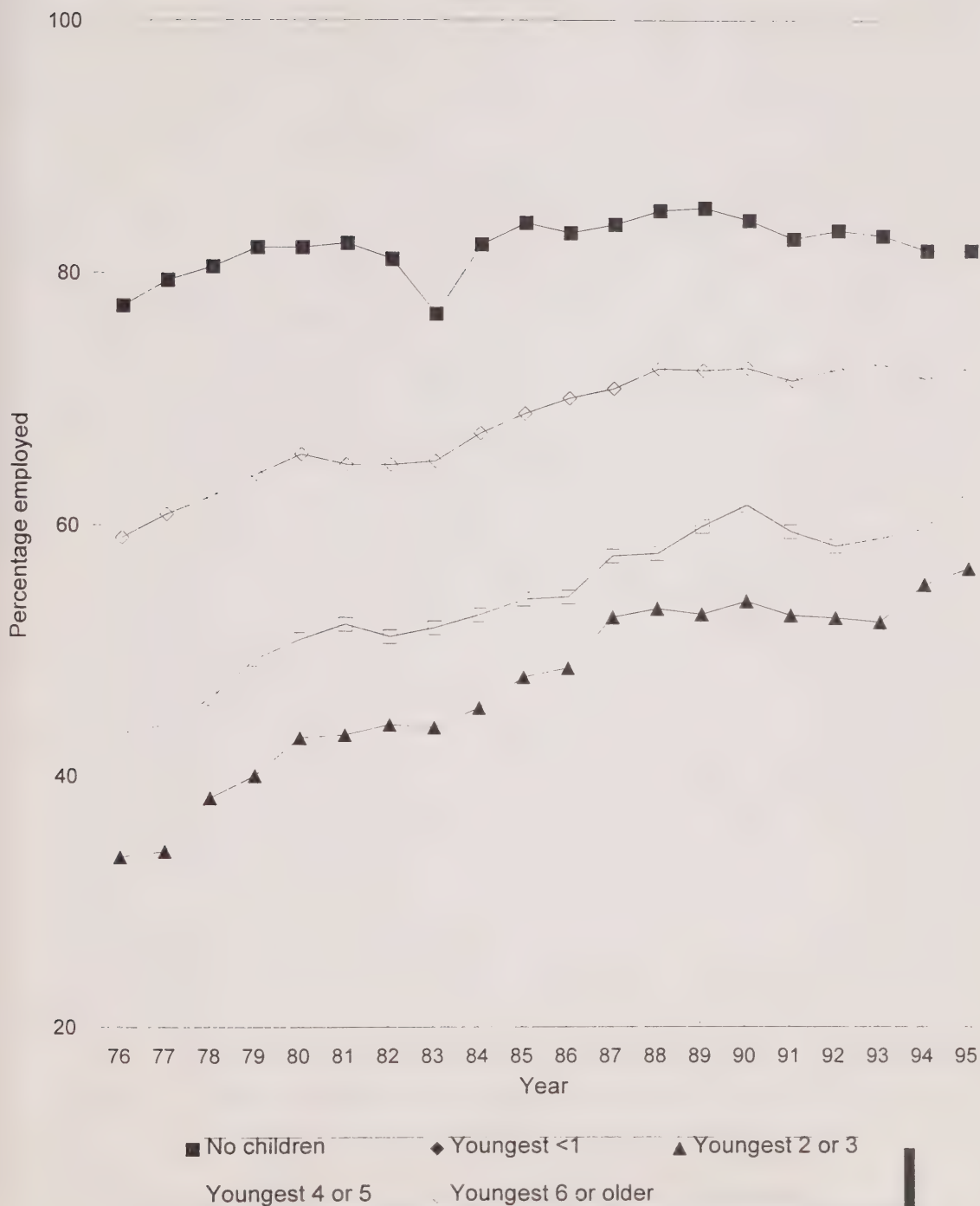


Figure 3: Percentage of Women Employed by Marital Status.

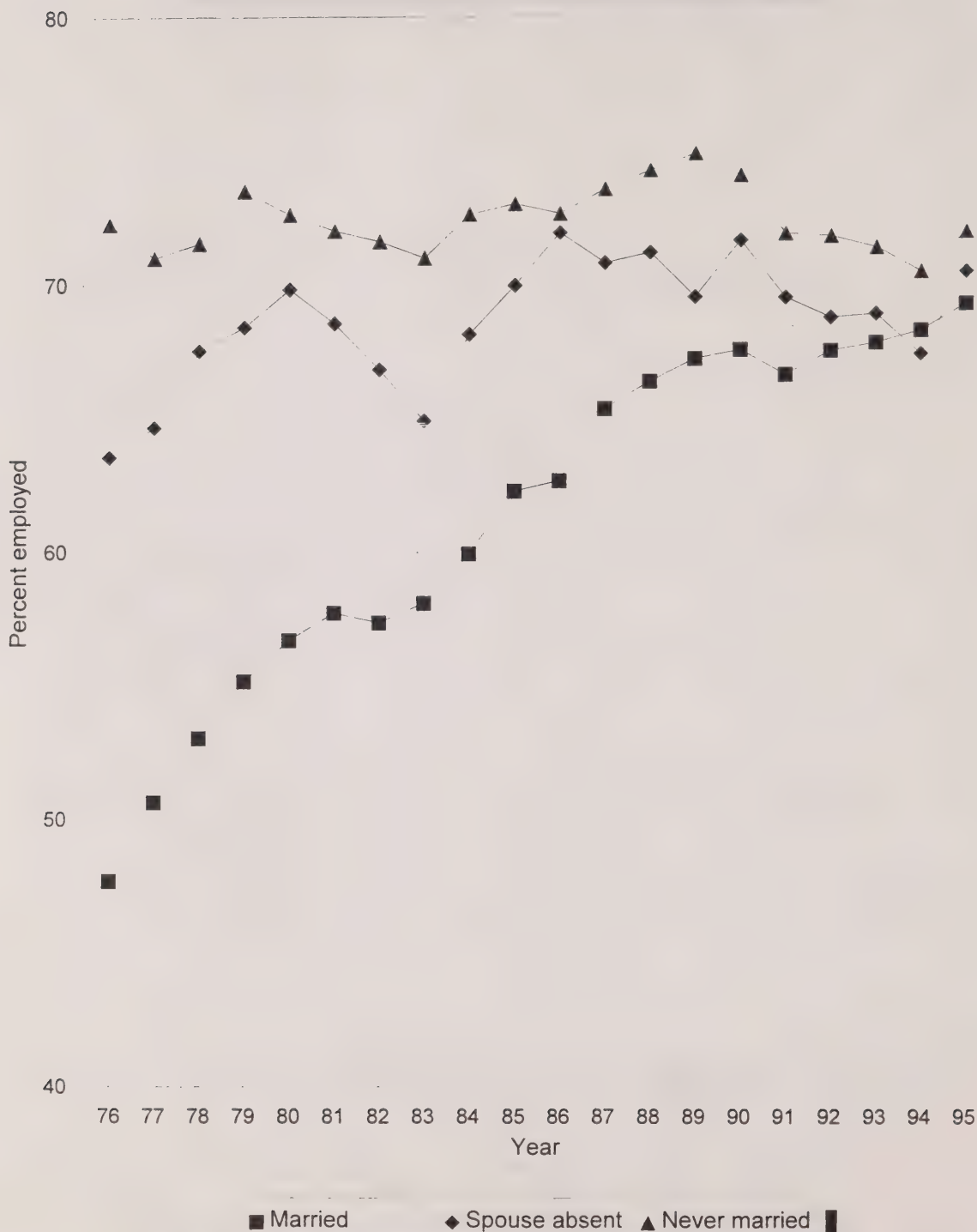




Figure 4: Work vs. Employment Exits of Women.

30

25

20

15

10

76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95  
Year

■ Exited from employment. ◆ Exited from work.

A woman is defined as employed if she worked or was on leave in week prior to survey.

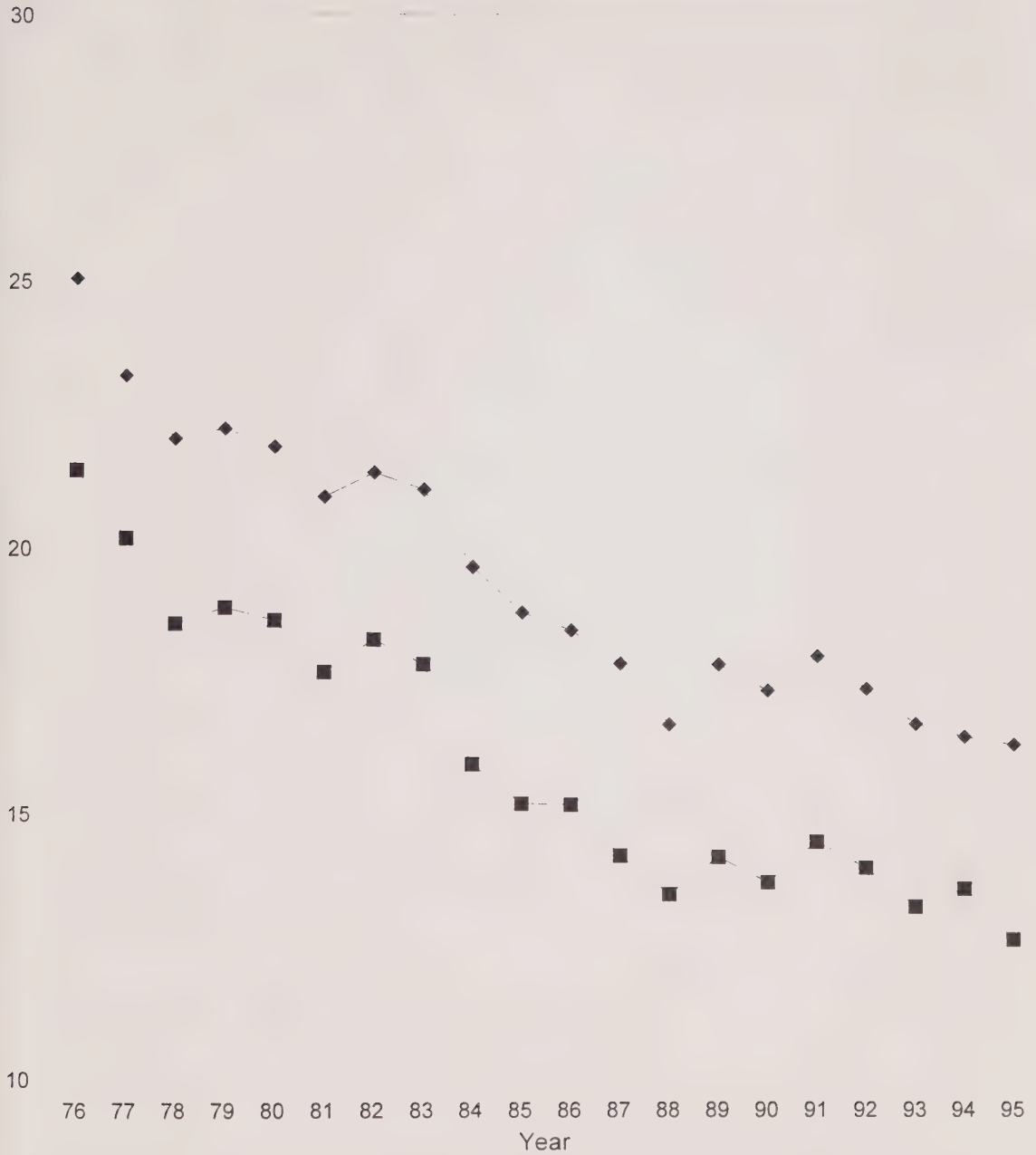


Figure 5: Women's Work Exit Rates by Age of Youngest Child.

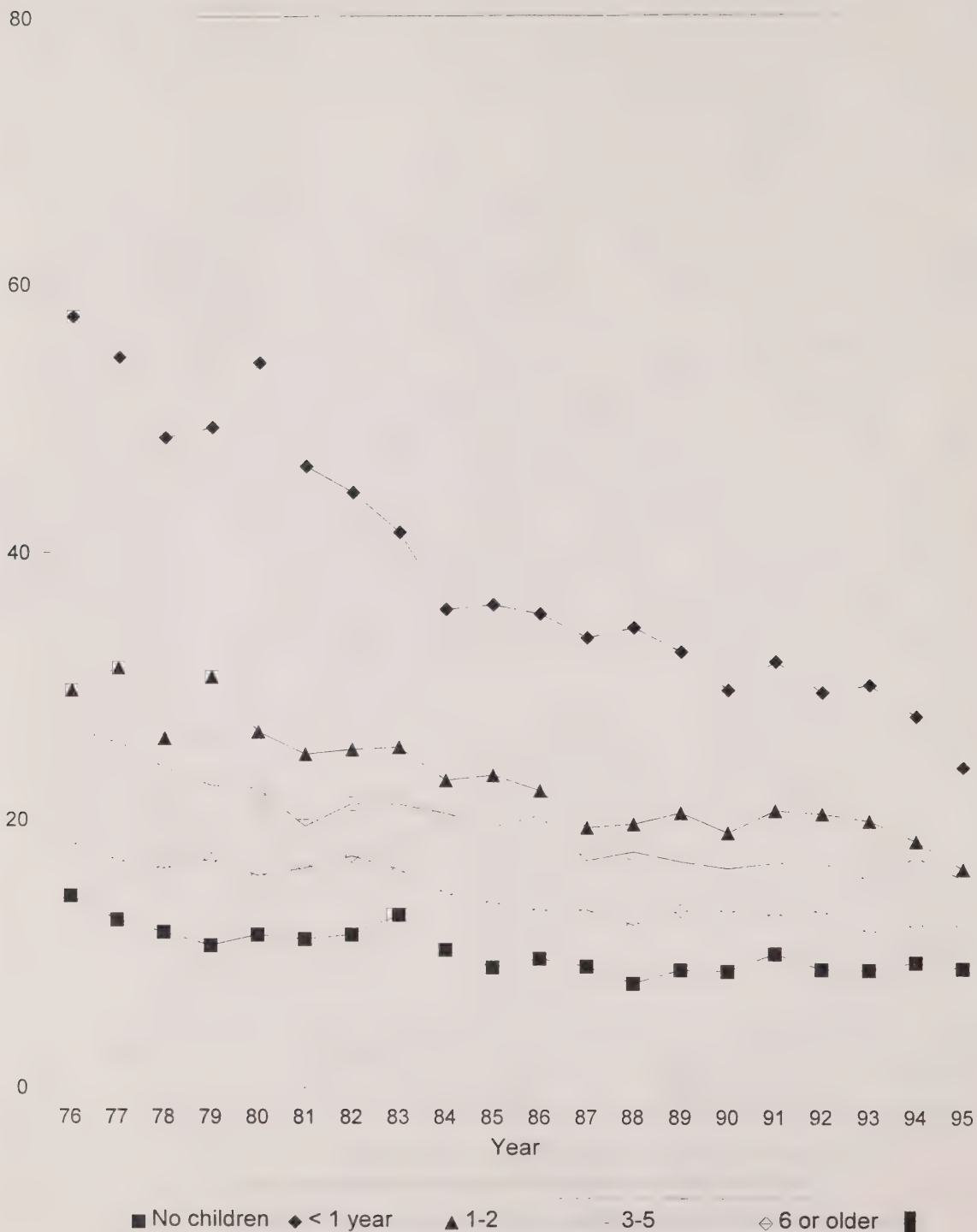
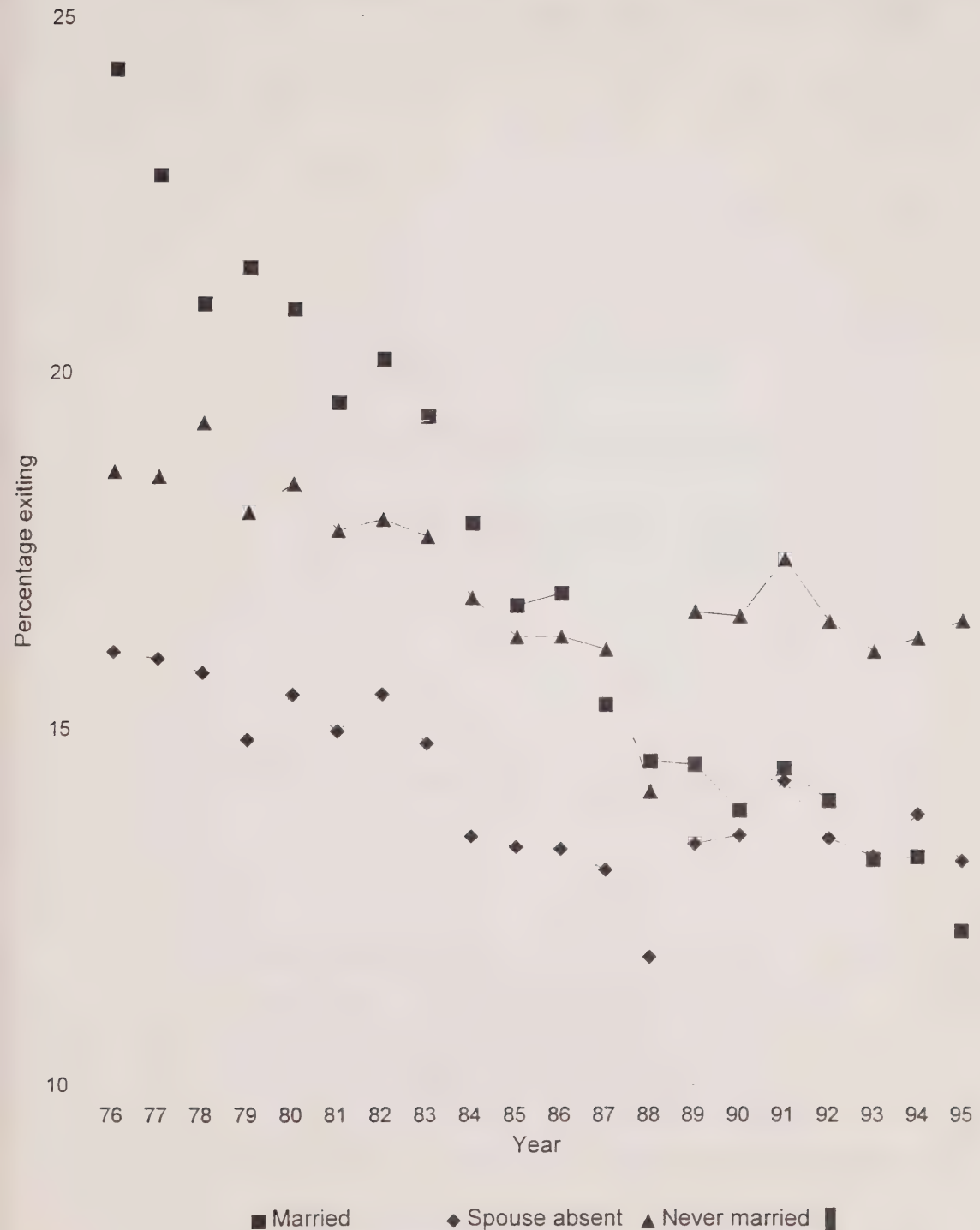


Figure 6: Work Exit rates by marital status.





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## **Session 2B (ii)**

### **The Employment Patterns of Women Following Childbirth**

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**CHILDREN'S EFFECTS ON WOMEN'S LABOR MARKET  
ATTACHMENT AND EARNINGS.**

June 1996

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## 1. Introduction.

Economic explanations of sex differentials in the labor market often rest upon the fact that women are more likely to exit the labor market than men. As numerous studies have demonstrated, childbearing is an important reason that women exit the labor market. Over the past 20 years, the effect of children on women's labor market attachment has diminished considerably. For example, the percent of women exiting work after having a child dropped from 58 to 24 percent between 1976 and 1995.

This study's first objective is to document the changing pattern of women's labor force exits over the past 20 years, particularly as it relates to childbearing. The analysis reveals a dramatic decline in exit rates among women -- particularly among married women with infants.

The second objective is to determine why this dramatic decrease in exit rates occurred. Among the explanations explored are increased education, earnings, and a movement of women into occupations where labor force attachment has a larger return. The results reveal that, despite a wide range of available information on standard labor supply variables, very little of the decrease in exit rates can be accounted for. Alternative explanations for the decline in exit rates are discussed.

The final objective of the study is to test an important prediction of the economic theory of sex differences in the labor market -- namely, if the impact of children on labor force attachment has diminished over time, their indirect effect on wages should be decreasing as well. There is strong evidence in support of this proposition.

## 2. Background.

The fact that women have more frequent career interruptions than men is the foundation for two well established economic theories of male-female wage differentials. According to the human capital theory, the fact that women are more likely to withdraw from the labor force than men results in several gender-related differences that lead to lower wages among women. For example, women will accumulate less human capital through labor market experience and be less willing to invest in training (general or specific) since the return on such investments is reduced by a higher quit rate. Also, given their higher quit rates, women may select into occupations that impose a lower penalty for an interruption. For example, women may choose jobs in which skills depreciate slowly during a period out of the labor force and jobs with less firm specific training.

A higher quit rate among women will also reduce their wages if employers practice statistical discrimination. According to this theory, sex-related differences in quit rates lead employers to discriminate against women if there are hiring or training costs that make quits costly to the employer.

Since these two theories imply that continuity of employment is an important determinant of wages, the relative constancy of the male-female wage gap as labor force participation rates increased rapidly between 1950 and 1980 was initially viewed as evidence against the theories. However, several studies note that rising female labor force participation does not necessarily generate an increase in the continuity of women's employment. That is, for example, suppose that 30 percent of the women work 100 percent of the time. If there is an increase in labor force participation among women that work less than 100 percent of the time, the average degree of continuity among women will fall.



Several studies document that increased employment continuity did not always accompany rising labor force participation rates. For example, Goldin (1989) shows that the average work experience of employed married women did not change substantially since 1920 despite the fact that the labor force participation rate of women increased seven fold. Also, O'Neill (1985) finds that average tenure of working women fell during the 1960s and early 1970s as labor force participation rates rose.

Since the mid-1970s, women's labor force continuity has improved. O'Neill and Polachek (1993) report that working women's labor market experience has been rising since the mid-1970s, thus contributing to a narrowing of the wage gap during the 1980s. Also, Shaw (1994) finds that the degree of persistence in young women's hours worked has increased over time.

Among employed women, the probability of a career interruption rises substantially around childbirth. Furthermore, Shapiro and Mott (1994) demonstrate that employment behavior surrounding a woman's first birth is an important predictor of labor market behavior 15 to 20 years into the future. Thus, examination of trends in women's employment behavior surrounding childbirth provides an important forecast of future labor market attachment and the direction of sex-differences in earnings and occupations.

Among studies that focus on the impact of children women's labor supply, an important issue is whether the model conditions on prior labor supply behavior. For example, while Klerman and Leibowitz (1994) examine the labor supply behavior of all women with a child less than a year of age, Even (1987) restricts his analysis to women that were working during pregnancy.<sup>1</sup> Nakamura and Nakamura (1994) discuss the desirability of conditioning on prior labor supply. They make the argument that, in cases where prediction accuracy is paramount,

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<sup>1</sup> Other studies of women's employment behavior surrounding childbirth include Leibowitz, Klerman and Waite (1992a, 1992b) and Klerman (1990).

prior labor supply and child status variables should be included in the model since they control for unobserved differences in "tastes for work".

Whether labor supply models should be conditioned on prior labor market experience depends largely on the investigator's objective. For example, if the objective is to determine whether employers should practice statistical discrimination against women, it can be argued that the relevant labor supply equation conditions on prior employment. That is, when an employer is deciding whether to invest in the training of a woman, the key statistic is not the percentage of all women that work, but rather the probability that a working woman will exit the labor force. If the objective is to determine how certain factors will influence the number of women working, it makes better sense to estimate an unconditional labor supply model. That is, for example, if the objective is to determine how an increase in real wages will affect the size of the labor force, it is essential to determine how the increased wages will affect the labor supply of all women -- not just those currently working.

In this study, focus is placed on employment following childbirth among women that worked in the year prior to the birth. In this sense, the study is an analysis of conditional labor supply. There are two reasons for the emphasis on employment following childbirth. First, childbirth is one of the most important reasons that women withdraw from the labor force early in their careers. Second, as noted by Shapiro and Mott (1994), employment following childbirth is a very strong predictor of future labor market attachment.

The study adds to the literature in several ways. First, it is the only study to examine trends in conditional employment following childbirth over the past 20 years. Second, it is the first to attempt to account for the tremendous increase in labor market attachment that has occurred. Finally, it examines whether the predictions of human capital and statistical

discrimination theories are borne out in terms of changing wage patterns predicted by the decline in women's exit rates.

### 3. The Data.

The data for the analysis are drawn from the March Current Population Survey (CPS) for the years 1976 through 1995.<sup>2</sup> The sample is restricted to civilian women aged 21 to 40 in the week of the survey. We exclude women under age 21 because of the complications that arise from school attendance and employment. We exclude those over age 40 to focus on women in their childbearing years.

An advantage of the March CPS data is that it includes information on employment status in the week prior to the survey and also asks a variety of questions about employment and earnings in the prior year. Thus, it is possible to examine employment transitions by comparing employment status last year with employment in the week prior to the survey. For the analysis, anyone that reports more than one week of employment in the prior year is defined as employed last year. Anyone that reports that they worked in the week prior to the survey or is on leave (paid or unpaid) is defined as employed this year.

### 4. Trends in Women's Employment.

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<sup>2</sup> There are two reasons that we did not include years prior to 1976. First, the earlier data provides less information on household relationships and makes it difficult to match mothers with children in many cases. Second, the earlier data has categorical responses on weeks worked in the prior year making it impossible to construct a realistic estimate of the hourly wage.

In figure 1, the percentage of 21 to 40 year old women employed is presented for the years 1976 through 1995. Over the period, the employment rate rose from 53.8 to 70.2. The growth in the employment rate has subsided over the past 10 years. Whereas it rose at an average of 1.2 percentage points per year between 1976 and 1985, average growth was only 0.4 percentage points per year since 1985.

Employment rates by child status are presented in figure 2. There are several notable points. First, employment rates are highest among women without children and lowest among women with infants (defined here as a child less than one year of age). Second, the differences in employment rates according to child status fell dramatically over time. For example, the employment rate of women with an infant rose 30.7 percentage points (from 22.4 to 53.1) percent between 1976 and 1995. Among women with no children, the employment rate rose only 4.4 percentage points (from 77.4 to 81.8). For women whose youngest child was more than one year old, the increase in the employment rates lies between these extremes.

Figure 3 presents employment rates by marital status. Consistent with the fact that the greatest increase in employment has occurred among women with children is that employment rates are rising more rapidly among married than never married women. The rate of growth in previously married (i.e. divorced, widowed, or separated) women's employment rates lies between these two extremes. Between 1976 and 1995, the employment rate rose 21.6 percentage points (from 47.7 to 69.3) among married women; rose 7.0 percentage points (from 63.5 to 70.5) among previously married women; and fell by 0.3 percentage points (from 72.3 to 72.0) among never married women. It is likely that the greatest growth in employment rates among married women is related to the fact that employment has risen most among women with young children.



## 5. Trends in Exit Behavior.

The evidence on employment rates makes it clear that the percentage of women employed has increased dramatically over time, particularly among women with young children. This does not, however, necessarily imply that there has been an increase in women's labor force attachment. In fact, within certain limits, it is possible to have a simultaneous increase in the percentage of women employed and the percentage of women that exit the labor force from one year to the next.

Because the predictions of human capital and statistical discrimination models rest upon gender differences in exit rates, not employment rates, this section examines trends in exit behavior -- with a focus on what occurs following childbirth. The analysis is restricted to women that were employed in the year prior to the March survey. Among such women, two types of exits are defined on the basis of the woman's reported activity in the week prior to the survey. A "work exit" occurs if a woman reports she did not work in the week prior to the survey. An "employment exit" occurs if a woman reports that she did not work and was not on leave (paid or unpaid) from her employer. Given its more comprehensive definition, the percentage of women that exit work will always exceed the percentage that exit employment.

Figure 4 presents work and employment exits for all women aged 21-40. Between 1976 and 1995, women's employment exit rates fell 8.9 percentage points from 21.5 to 12.6, and the work exit rate fell 8.7 percentage points from 25.0 to 16.3. The fact that the absolute decrease in exit rates is virtually the same for work and employment exits suggests that the percentage of employed women that go on leave has been stable over time.



The fact that exit rates have fallen so dramatically over time among women implies that gender differences in earnings and human capital accumulation should be falling *ceteris paribus*. With greater labor force attachment, women should be more willing to seek jobs that require specific training, and employers should be more willing to hire women into such jobs. Also, with women's improved labor force attachment, differences in labor market experience between men and women should be on the decline.

Employment exit rates are presented in figure 5 by child status. Across the entire time period, exit rates are highest for women with an infant and lowest among those with no children. The difference in exit rates across groups has dropped dramatically over time, however. Whereas the exit rates of women with an infant fell 25.7 percentage points (from 57.6 to 23.9), those for women with no children fell only 5.4 percentage points (from 14.3 to 8.9 percent). For women with children more than a year old, the decline in the exit rate was somewhere between these two extremes. In general, exit rates have decreased for women with every child status examined and there has been a narrowing of differences across child status groups.

The reduced effect of children on exit rates is consistent with the convergence of exit rates across marital status presented in figure 6. In 1976, the exit rates were 24.3, 16.1 and 18.6 for married, previously married, and never married women. By 1995, exit rates had fallen for the three groups to 12.2, 13.1 and 16.5. While exit rates fell for all three groups, they fell most for married and then previously married women. In fact, whereas married women had the highest exit rates in 1976, by 1995 they had the lowest exit rates. Given that married women are more likely to be affected by childbearing, the greater decline in their exit rates is not entirely surprising. It is, however, rather surprising that married women have lower exit rates than never married women today. Given that never married women are not likely to have a partner that can generate

income when she is out of work, it is surprising that such women are more likely to exit employment.

In summary, exit rates fell dramatically over the past 20 years, particularly among women with young children and married women. The economic impetus and consequences of this dramatic change are the subject of the next two sections.

## 6. Why have married women's exit rates declined?

The standard theory of women's employment decisions rests on a comparison of market and reservation wages. A woman's reservation wage is the minimum wage at which she is willing to accept employment. A woman works if the wage rate offered in the market exceeds the reservation wage. For a woman to exit, either the reservation wage must increase or the market wage must decrease. In most circumstances, women's market wages are not likely to fall with time since on-the-job training and the accumulation of experience will naturally increase their wages. The exception occurs when there is a decrease in labor demand causing employers to cut wages. It is probably the case, however, that most working women's exits result from sudden changes in their reservation wages. For example, the birth of a child will likely increase the reservation wage and increase the likelihood that a woman exits the labor force.

An important consideration in the wage/reservation theory is the impact of human capital accumulation and depreciation. Mincer and Polachek (1974) describe the relevant wage rate as the "full wage" which includes (1) the market wage, (2) the present value of the reduction in future earnings caused by the increased depreciation of human capital during time out of the labor force; and (3) the present value of the loss in future earnings associated with the forgone

accumulation of human capital. Using this expanded definition of the relevant wage rate, other things being the same, the greater is the depreciation of wages during time out of the labor force the less likely a woman will exit. Similarly, the greater is the foregone growth in wages during time out of the labor force, the less likely a woman will exit.

There are several pieces of empirical evidence consistent with the notion that labor force withdrawals reduce earnings and that women select into occupations that penalize exits the least. Mincer and Polachek (1974) find that wage deterioration during time out of the labor force is highest for those with the highest level of schooling and in high skill occupations. Moreover, Polachek (1981) shows that women tend to select into the occupations that have the lowest atrophy rates. Light and Manuelita (1995) report that women's wages fall less than men's after a temporary departure from the labor market and that they rebound more quickly after re-entry. Also, Hirsch and Macpherson (1995) show that occupations with a disproportionate share of women tend to have less training. In general, the greater frequency of labor force exits impacts the types of jobs that women enter and their earnings growth.

Given these considerations, a model of women's exit behavior must control for several factors: the market wage, factors influencing the reservation wage, and factors that influence the impact of an exit on future wages. Possible explanations for the decline in exit rates are higher market wages, lower reservation wages, or a movement of women into jobs that have greater wage growth and/or depreciation rates.

The CPS data include information on wage rates. Several variables that are likely to influence the reservation wage are also available -- marital status, other family income (excluding transfer payments that would be endogenous to the woman's work decision), children in various

age groups, and the woman's age and race. Finally, occupation and industry controls are included to account for differences in the level of training and skill atrophy across jobs.

Since the earlier examination of trends in exit rates by marital status reveals that most of the decline has occurred among married women, it appears that separate analysis by marital status is in order. For the sake of brevity, focus is placed only on married women in this section. In work not reported here, the stability of exit rates among never married and previously married women is consistent with the observed changes in their characteristics.<sup>3</sup>

Among married women that worked in the year prior to the survey, there are several factors that may have contributed to the rapid decline in their exit rates. Average real wages (in 1995 dollars) rose from \$10.37 to \$11.57. Since children, particularly when young, generally increase the reservation wage, the decline in the average number of children from 1.6 to 1.5 may have contributed to a modest decline in exit rates. Finally, women's jobs have changed in ways that could contribute to reduced exit rates. Also, the increased self-employment of women could reduce exit rates in two ways. First, the flexibility of some types of self-employment could make it easier for women to stay at home with an infant and continue working. Also, for some self-employed workers there will be investments in capital or reputation that could drive up the opportunity cost of staying out of the labor force.

To determine the extent to which the above changes have contributed to married women's declining exit rates, a decomposition of the change in exit rates over time is performed. The comparison is made between 1976-79 (1970s) and 1992-95 (1990s) exit rates. A probit model of exit rates is estimated for 1976-79. Using the 1976-79 probit coefficients, a predicted exit rate is

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<sup>3</sup> In particular, in a probit model of exit rates, the effect of year dummies is statistically insignificant among previously married women. Among never married women, a comparison of the 1976-79 and 1992-95, reveals no significant difference in behavior. For previously married women, there is a statistically significant 2.7 percent lower exit rate in 1992-95 than in 1976-79. Among married women, the exit rate is estimated to be 7.0 percent lower in the later period.



generated for women in 1992-95. The difference in the 1976-79 exit rate and that predicted for 1992-95 is the change in the exit rate that can be accounted for by changes in observed characteristics of working women. Using the approach described in Even and Macpherson (1990), it is also possible to calculate how much of the change in exit rates can be attributed to changes in a particular explanatory variable.

Table 2 presents the estimated probit models of exit behavior for the 1976-79 and 1993-95 samples. Most of the results are consistent with expectations. Focusing on the probit model for the 1976-79 sample momentarily, the effect of children on the probability of exit is quite substantial when the child is an infant but diminishes rapidly as the child ages. A child under the age of one increases the probability of an exit by 26.7 percent. The effect drops sharply to 8.9 percent for a child aged one to two, and falls gradually to .8 percent for children aged 13-16. Children 17 and over have a statistically insignificant effect on exits.

A higher real wage has a statistically significant but diminishing negative effect on the probability of an exit<sup>4</sup>. While the effect of real wages is statistically significant at the .01 level, quantitatively the effect is quite small. At the mean value of the minimum wage in 1973-76, a \$1 increase in the real wage reduces the probability of an exit by only .03 percentage points. This effect is minuscule in comparison to the effect of young children on the probability of an exit.

The type of job held by women also has an important effect on the probability of exiting. Consistent with expectations, self employed women are 10.2 percent less likely to exit than a woman wage and salary worker in the private sector. Also, there are significant differences in the probability of an exit across industry and occupation. The differences across industry and

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<sup>4</sup> The diminishing effect is reflected in the positive coefficient on the quadratic term. The marginal effect of higher real wages does not turn positive until wages rise above \$59.



occupation could reflect variations in the cost of an exit from the labor force due to variations in training or skill depreciation rates.

Other results consistent with predictions are the fact that more educated women, who are generally believed to have more firm specific training, are less likely to exit. Also, other sources of family income increase the probability of an exit by increasing the reservation wage through an income effect.

Comparing the 1976-79 estimates with those for 1992-95 reveals a high degree of similarity. The most notable difference is that infants have a much smaller effect on exit probabilities in the 1990s than in the 1970s. Whereas an infant increased the probability of an exit by 26.7 percentage points in the 1970s, the effect fell to 10.4 percent in the 1990s.

The decomposition of the change in married women's exit rates is presented in table 3. The exit rate fell by 9.6 percentage points between the 1976-79 and 1992-95 sample. Using the 1970s probit coefficients, only 2.3 percentage points of this decline can be accounted for by changes in married women's observed characteristics. With the 1990s coefficients, 2.1 percentage points are accounted for. In either case, about one fourth of the decline in married women's exit rates can be accounted for by the long list of control variables included in the probit models.

Given the fact that childbirth is arguably the most important cause of women's exits in the labor force and that the impact has dramatically fallen over time, a focus on behavior surrounding childbirth is instructive. As in the prior section, focus here is placed upon the behavior of married women.

In table 4, a decomposition of the change in exit rates between the 1970s and 1990s sample is presented.<sup>5</sup> Of the 26.7 percentage point decline in exit rates, only 3.8 (4.2) percentage points can be accounted for by the characteristics included when using the 1970s (1990s) probit coefficients. Thus, less than one-sixth of the decline in exit rates can be accounted for by changes in observed worker characteristics.

## 7. The Implication of Greater Labor Force Attachment for Women's Earnings.

The greater likelihood of labor force exits among women is often pointed to as a cause of several gender related differences in labor market outcomes. This section investigates whether the large decline in women's exit rates has resulted in the wage effects predicted by human capital and statistical discrimination theory. In particular, the changing pattern of exit rates has implications for women's wages through their effect on job choices and the level of training received.

One important change in exit rates is that, whereas married women had substantially higher exit rates than previously married or single women in the 1970s, they have slightly lower exit rates in the 1990s. To the extent that married women and their employers incorporate this behavior into their human capital decisions, married women's investments in training should have increased. Also, whereas married women should have been more inclined to be in traditionally "female" occupations in the 1970s, this tendency should have diminished over time. Finally, as married women's investments in human capital improve and as employers practice less statistical

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<sup>5</sup> The probit estimates for the 1970s and 1990s data are not presented for the sake of brevity. Generally speaking, the pattern of results is similar to that for all married with two exceptions. First, the statistical significance of the control variables are lower when the sample is restricted to women with infants. This is undoubtedly partially due to the much smaller sample size. Second, children have a much smaller effect on exit rates when the sample is restricted to women with infants. In fact, children aged two or over have either a zero or negative effect on the exit rate of married women with infants. The fact that a two year old is associated with a lower exit rate might reflect the fact that a woman working with a two year old has a strong attachment to the labor market.

discrimination against them, married women's wages should have improved relative to other women.

Another important change in exit rates is the remarkable decrease in the effect of childbirth on exit rates -- particularly among married women. Since children have a smaller effect on the probability of an exit, their negative effect on wages should have diminished over time, especially among married women.

Table 5 presents log-wage regressions that for the 1970s and 1990s. In the first two columns, estimates are presented for all women aged 21-40. Consistent with the hypothesized effect, the impact of children on wages has diminished over time. Whereas each child reduced wages by 3.4 percentage points in the 1970s, the effect had fallen to 2.5 percent by the 1990s.<sup>6</sup> Consistent with the dramatic reduction in married women's exit rates relative to single and previously married women is the fact that married women's wages have increased relatively. In the 1970s, married women had slightly higher wages (.009) than other women, though the difference was statistically insignificant. By the 1990s, married women earned 4.6 percent higher wages than other women, and the difference is statistically significant at the .01 level.

In columns 3-8 of table 5, log-wage regressions are presented for married, never married, and previously married women separately. Since the effect of children on exits has dropped most for married women, the negative effect of children on wages should have fallen most for married women. The results are consistent with this hypothesis. Among married women, the marginal effect of children on wages fell from 3.1 percent in the 1970s to 1.6 percent in the 1990s. For previously married women, there was no statistically significant change in the marginal effect of children on wages over time. Among single women, there was a statistically significant increase

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<sup>6</sup> The t-statistic for equality of the coefficients on number of children is 2.99. Thus, there is a statistically significant difference in the effect of children on wages in the 1970s and 1990s.

in the negative effect of children on wages.<sup>7</sup> Thus, the negative impact of children on wages has diminished only for married women. This is consistent with the fact that exit rates following childbirth fell most among married women.

Part of the reason that children should have a smaller negative effect on women's earnings in the 1990s than the 1970s is that childbearing is less likely to reduce women's labor market experience or sever ties with an employer. Another part of the explanation is that children should have a smaller effect on occupational and industrial choices. That is, if women are less likely to interrupt their careers when they have children, they should be more inclined to select into occupations and industries with training investments.

To the extent that the measured effect of children on wages is capturing tenure, occupation, and industry effects, the estimated coefficient on children should diminish as these variables are added to the wage equation. Moreover, given that the evidence from exit equations suggests that the link between children and these labor market characteristics has diminished over time, the addition of these variables to wage equations should reduce the estimated child effect more in the 1970s than the 1990s.

To investigate these issues, another data source is required since the March CPS has no information on employee tenure or experience. The May 1979 and April 1993 CPS have virtually the same wage and labor market information as the March surveys with additional information on employee tenure. Unfortunately, however, no information is available for total labor market experience.

In table 6, the estimated effect on number of children on wages is presented for four specifications. All four include numerous employer and employee characteristics and the number

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<sup>7</sup>The t-statistic for testing the null hypothesis of equality coefficients on number of children in the 1970s and 1990s is 2.09 for never married women. Thus, the null is rejected at the .05 level.



of children in the family. In the first specification, tenure, occupation, and industry controls are excluded from the regression. In the second through fourth specifications, these controls are added separately and then jointly to determine how much of the reduced children effect is due to the fact that children have smaller effects on tenure and industrial or occupational choice. The regressions are estimated separately by marital status and by year.

Consistent with the results from the March CPS data, the effect of children on wages fell across time for all women, married and previously married women -- regardless of whether tenure, industry or occupation are controlled for. Also, as in the March CPS, the negative effect of children rose over time for never married women.

Comparing the four specifications for a given sample reveals that part of the explanation for the declining effect of children on wages is their reduced correlation with tenure, occupation, and industry. For example, in the regression for all women, the coefficient on children dropped .018 between 1979 and 1993 when tenure, occupation, and industry are excluded from the model. When these additional controls are added, the coefficient on children drops only .011 between 1979 and 1993. Thus, the reduced effect of children on wages over time is partly because children have less effect on women's tenure and on their inclination to select into low wage occupations or industries.

The results by marital status reveal a similar pattern for married and previously married women. Without controls for tenure, occupation or industry, the coefficient on children drops .019 and .033 among married and previously married women. With these controls added, the coefficients drop .009 and .019. Thus, the changing relationship between number of children and these labor market characteristics (tenure, occupation and industry) account for an important share of the declining effect of children on wages.



For never married women, the negative wage effect of children has grown over time, but the increase in the coefficient is smaller when tenure, industry, and occupation are controlled for. This seems to suggest that, in contrast to the case for married and previously married women, the adverse effect of children on labor market characteristics has worsened over time among never married women.

## 8. Summary and Conclusions.

This study documents the dramatic decline in women's exit rates that has occurred since 1976 and shows that the declines have been most pronounced among married women with young children. A model of married women's exit behavior was estimated as a function of labor market characteristics and factors that could influence the value of time in the home. The statistical model of exit behavior was used to determine how much of the change in married women's that occurred between the 1970s and 1990s could be accounted for by changes in observed characteristics. Less than one-fifth of the decline in exit rates can be accounted for by changes in observed characteristics. This is true for the exit behavior of all married women, and for women with a child less than one.

The fact that changing labor market characteristics account for so little of the decline in exit rates leads to a natural question -- what has caused the decline that is not included in the model? A simple response is that "social norms" have changed and women now find it more acceptable to work when they have young children. Testing this hypothesis is rather difficult, however. Before abandoning the neoclassical economic explanations, there are several additional avenues that might be explored. First, rising divorce rates may increase married women's desire

to establish a career. In support of this argument, Johnson and Skinner (1986) find that higher divorce probabilities increase married women's labor supply. An advantage of this explanation is that it is consistent with a greater decline in married women's exit rates than single or previously married women's exits.

A second possible explanation for the rapid decline in married women's exit rates is that there may be a compounding effect of a decrease in exits. Namely, if married women's exit rates fall, statistical discrimination against women diminishes and women can move into jobs with greater training investments. As they move into such jobs, the cost of an exit is increased. The difficulty in empirically testing this hypothesis is that training investments are difficult to measure.

Given that the exit rates of married women fell more than never or previously married women, human capital and statistical discrimination theory predict that married women's wages should have risen relative to others. This prediction is supported in the wage analysis. Furthermore, since children have a much smaller effect on exit rates in the 1990s, theory also predicts that the effect of children on wages should diminish over time. This hypothesis was tested and supported with two separate data sources. In both cases, the negative effect of children on wages has diminished over time. The analysis also reveals that part of the reason that children have a smaller negative effect on married and previously married wages is that the negative relationship between children and "wage enhancing" labor market characteristics (as measured by tenure, occupation, and industry) has diminished over time.

In general, the predictions of human capital and statistical discrimination theory are borne out by the empirical analysis. As women's exits have fallen, their wages have grown. Moreover, as the effect of children on exits fell, their effect on wages have dropped as well. Finally, the

sub-groups of women whose exit rates fell the most have generally experienced the greatest wage growth since the 1970s.

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Table 1: Sample Means for Married Women Aged 21-40 Who Were Employed in the Prior Year.

Year	Years of Education	% with a college degree	% Self-employed	Number of Children	Sample Size
1976	12.66	17.97	3.49	1.61	7,952
1977	12.73	18.77	3.89	1.58	10,047
1978	12.74	18.93	4.59	1.54	9,790
1979	12.83	19.38	4.44	1.52	10,481
1980	12.88	19.8	4.85	1.49	12,683
1981	12.91	19.34	5.29	1.47	12,627
1982	12.97	20.56	5.5	1.47	11,367
1983	13.09	22.09	5.54	1.41	11,405
1984	13.19	23.62	6.4	1.43	11,407
1985	13.17	22.9	5.81	1.42	11,744
1986	13.17	22.69	5.83	1.43	11,763
1987	13.22	23.23	5.97	1.44	11,872
1988	13.23	23.41	6.41	1.44	11,755
1989	13.28	25.01	6.12	1.44	11,020
1990	13.29	25.07	6.21	1.45	11,736
1991	13.35	25.58	6.38	1.46	11,372
1992	13.33	24.46	6.35	1.46	11,192
1993	13.44	25.98	6.12	1.46	10,951
1994	13.51	26.06	6.72	1.47	10,282
1995	13.55	26.89	7.31	1.46	10,097

Table 2: Probit Estimates of Exit Model for Married Women Aged 21-40.

	1976-79		1992-95	
	<u>dp/dx</u>	<u>t-statistic</u>	<u>dp/dx</u>	<u>t-statistic</u>
Intercept	0.05	1.38	-0.07	-2.72
Number of Children of Age:				
<1	0.27	39.43	0.1	23.04
1	0.09	11.52	0.04	7.67
2	0.05	6.62	0.03	7.21
3	0.04	6.14	0.02	5.07
4	0.04	5.36	0.02	4.94
5	0.03	3.76	0.02	3.78
6-7	0.02	4.68	0.02	4.63
8-9	0.02	3.35	0.01	1.41
10-13	0.01	2.29	0	0.39
14-17	-0.01	-1.43	0	0.45
Education:				
HS Graduate	-0.03	-4.95	-0.04	-6.26
Some College	-0.03	-3.78	-0.04	-6.15
College Graduate	-0.04	-4.2	-0.04	-5.1
Race:				
Black	-0.06	-6.73	0.01	1.37
Other Nonwhite	-0.02	-1.57	0.01	1.24
Real Wage	0	-9.24	0	-10.66
Real Wage Sq/100	0	10.93	0	12.03
Other Income/100	0.08	3.13	0	-0.15
Other Income Sq/100	0	1.93	0	3.91
Parttime	0.08	16.78	0.08	22.37
Age:				
24-26	-0.03	-3.86	-0.03	-3.93
27-29	-0.04	-5.64	-0.04	-5.46
30-32	-0.07	-8.03	-0.05	-7.73
33-35	-0.08	-8.72	-0.06	-8.53
36-38	-0.09	-8.75	-0.06	-8.75
39-40	-0.1	-9.24	-0.07	-8.63
Public sector employee	-0.02	-2.68	-0.01	-2.2
Self-employed	-0.1	-9.02	-0.05	-7.56
Sample Size	38,270		42,522	
Scale Factor	0.28		0.18	
Log-Likelihood	-18,247.17		-14,767.78	

Notes: The partial derivatives (dp/dx) are evaluated the sample means of the independent variables. The partial derivative divided by the scale factor yields the associated probit coefficient. The model also includes controls for the amount of training required in the 3-digit occupation, 8 region, 12 occupation, and 12 industry dummies.

Table 3: Factors Contributing to Change in Exit Rates Among Married Women  
Between 1976-79 and 1992-95.

Base Year Coefficients	<u>1976-79</u>	<u>1992-95</u>
Variable:		
Children	0.43	0.22
Education	-0.28	-0.36
Race	0.02	0.01
Wage	-0.25	-0.23
Other Income	-0.1	0
Occupation	0	-0.24
Industry	0.11	0.05
Parttime	-0.09	-0.1
Region	-0.09	-0.06
Age	-1.11	-0.89
Public	0.08	0.06
Self-employed	-0.21	-0.12
Occupation Characs	-0.77	-0.46
Total Explained	-2.27	-2.14
Total Unexplained	-7.3	-7.43
Total Change	-9.57	-9.57

Table 4: Factors Contributing to Change in Exit Rates Among Married Women with a Child Under One Between 1976-79 and 1992-95.

Base Year Coefficients	<u>1976-79</u>	<u>1992-95</u>
Variable:		
Children	-0.09	-0.09
Education	-0.07	0.06
Race	-0.02	-0.05
Wage	0	0
Other Income	-0.21	0.16
Occupation	0.22	-0.66
Industry	0.18	0.26
Parttime	0.11	0.22
Region	0.2	-0.08
Age	-1.9	-2.56
Public	0.1	0.1
Self-emp	-0.52	-0.33
Occ Charcs	-1.36	-0.83
Total Explained	-3.83	-4.2
Total Unexplained	-22.89	-22.52
Total Change	-26.72	-26.72

Table 5: Log-wage regressions by marital status.

	All women		Married women		Previously married women		Never married women	
	1976-79	1992-95	1976-79	1992-95	1976-79	1992-95	1976-79	1992-95
Intercept	1.491 38.78	1.452 41.24	1.492 30.99	1.586 33.66	1.543 13.48	1.31 12.74	1.507 18.8	1.367 21.12
Number of children	-0.034 -16.92	-0.025 -11.71	-0.031 -12.28	-0.016 -6.11	-0.035 -7.3	-0.038 -7.4	-0.031 -5.67	-0.048 -8.53
Years of education (reference group < 12 years)								
12	0.1 14.92	0.119 14.61	0.072 8.65	0.101 9.06	0.133 9.25	0.149 8.69	0.187 10.32	0.125 7.4
13-15	0.133 17.4	0.211 24.82	0.109 11.11	0.198 16.86	0.173 10.25	0.237 12.96	0.194 10.45	0.199 11.64
16 or more	0.225 24.78	0.39 41.3	0.202 17.16	0.39 30.22	0.301 12.96	0.417 17.93	0.272 13.41	0.353 19.26
Race (reference group White)								
Black	0.03 4.21	-0.04 -5.75	0.051 4.97	-0.03 -2.59	0.025 1.79	-0.045 -2.98	-0.018 -1.35	-0.049 -4.54
Other race	0.023 1.72	-0.018 -2.11	0.034 1.99	-0.033 -2.77	-0.027 -0.78	0.007 0.31	0.018 0.7	-0.001 -0.05
Part-time worker	0.042 8.38	-0.016 -3.34	0.054 8.6	-0.002 -0.37	0.07 4.91	-0.036 -2.67	0.008 0.65	-0.038 -4.18
Age (reference group aged 21-23)								
24-26	0.108 16.23	0.101 13.11	0.102 10.85	0.109 8.22	0.055 2.74	0.071 2.38	0.126 11.47	0.101 9.75
27-29	0.168 23.82	0.197 25.25	0.152 15.96	0.191 15.06	0.123 6.29	0.147 5.19	0.204 14.6	0.212 18.06
30-32	0.195 25.84	0.261 33.45	0.171 17.15	0.253 20.29	0.151 7.67	0.192 6.97	0.272 15.31	0.286 22.52
33-35	0.222 27.72	0.298 37.62	0.199 19.02	0.288 23.07	0.166 8.09	0.254 9.33	0.314 14.77	0.307 21.76
36-38	0.237 28.64	0.32 39.87	0.204 19.05	0.306 24.48	0.232 11.17	0.27 9.97	0.311 12.83	0.349 22.17



Table 5: Log-wage regressions by marital status.

39-40	0.222	0.329	0.197	0.31	0.186	0.277	0.314	0.393
	23.48	37.33	16.4	23.46	8.16	9.85	9.97	20.17
Public sector employee	-0.005	-0.041	0.002	-0.041	0.006	0.001	-0.019	-0.054
	-0.7	-5.96	0.22	-4.57	0.36	0.05	-1.46	-4.16
Self employed	-0.276	-0.18	-0.298	-0.201	-0.15	-0.126	-0.141	-0.105
	-22.9	-18.97	-21.62	-18.21	-4.43	-4.54	-3.34	-3.97
Marital Status (reference group never married)								
Married	0.009	0.046						
	1.52	8.74						
Previously married (widowed, divorced, or separated)	0.024	0.009						
	3.21	1.37						

<sup>1</sup> Wages regression also include controls for 13 occupations and 14 industries. T-statistics are presented below coefficient estimates.

Table 6: Effect of Number of Children on Wages.

<u>Model</u>	<u>All Women</u>		<u>1993</u>	
	<u>Coefficient</u>	<u>T-stat</u>	<u>Coefficient</u>	<u>T-stat</u>
No Tenure/No Ind & Occ	-0.039	-7.16	-0.021	-3.69
With Tenure/No Ind & Occ	-0.03	-5.55	-0.017	-3.04
No Tenure/With Ind & Occ	-0.031	-5.97	-0.015	-2.88
With Tenure/With Ind & Occ	-0.023	-4.52	-0.012	-2.38
<u>Married Women</u>				
No Tenure/No Ind & Occ	-0.037	-5.4	-0.018	-2.55
With Tenure/No Ind & Occ	-0.027	-4.1	-0.015	-2.18
No Tenure/With Ind & Occ	-0.029	-4.55	-0.015	-2.22
With Tenure/With Ind & Occ	-0.022	-3.41	-0.013	-1.96
<u>Previously Married Women</u>				
No Tenure/No Ind & Occ	-0.056	-4.4	-0.02	-1.82
With Tenure/No Ind & Occ	-0.046	-3.58	-0.021	-1.67
No Tenure/With Ind & Occ	-0.041	-3.43	-0.015	-1.31
With Tenure/With Ind & Occ	-0.033	-2.78	-0.014	-1.19
<u>Never Married Women</u>				
No Tenure/No Ind & Occ	-0.015	-1.01	-0.03	-2
With Tenure/No Ind & Occ	-0.014	-0.93	-0.02	-1.41
No Tenure/With Ind & Occ	-0.008	-0.56	-0.02	-1.33
With Tenure/With Ind & Occ	-0.007	-0.5	-0.01	-0.81

Notes: Data sources are the May 1979 and April 1993 Current Population Surveys. The sample is restricted to female wage and salary workers aged 21 to 40. The models also include controls for age and its square, part-time status, firm size (4 dummies), plant size (2 dummies), race (2 dummies), union coverage, education (3 dummies), and public sector status.

Figure 1: Employment Rates of Women Aged 21-40.

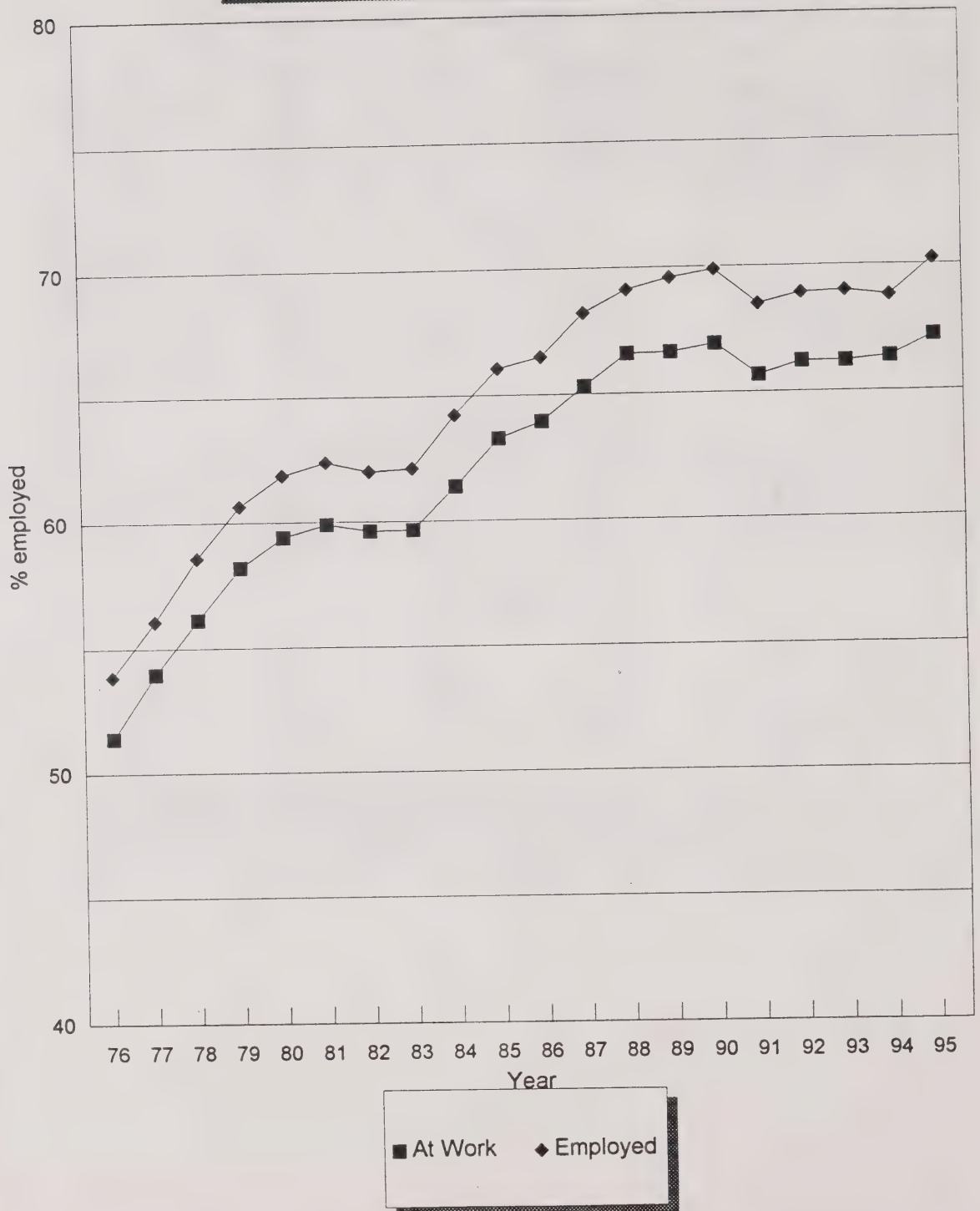


Figure 2: Percentage of 21-40 Year Old Women Employed  
by Age of Youngest Child.

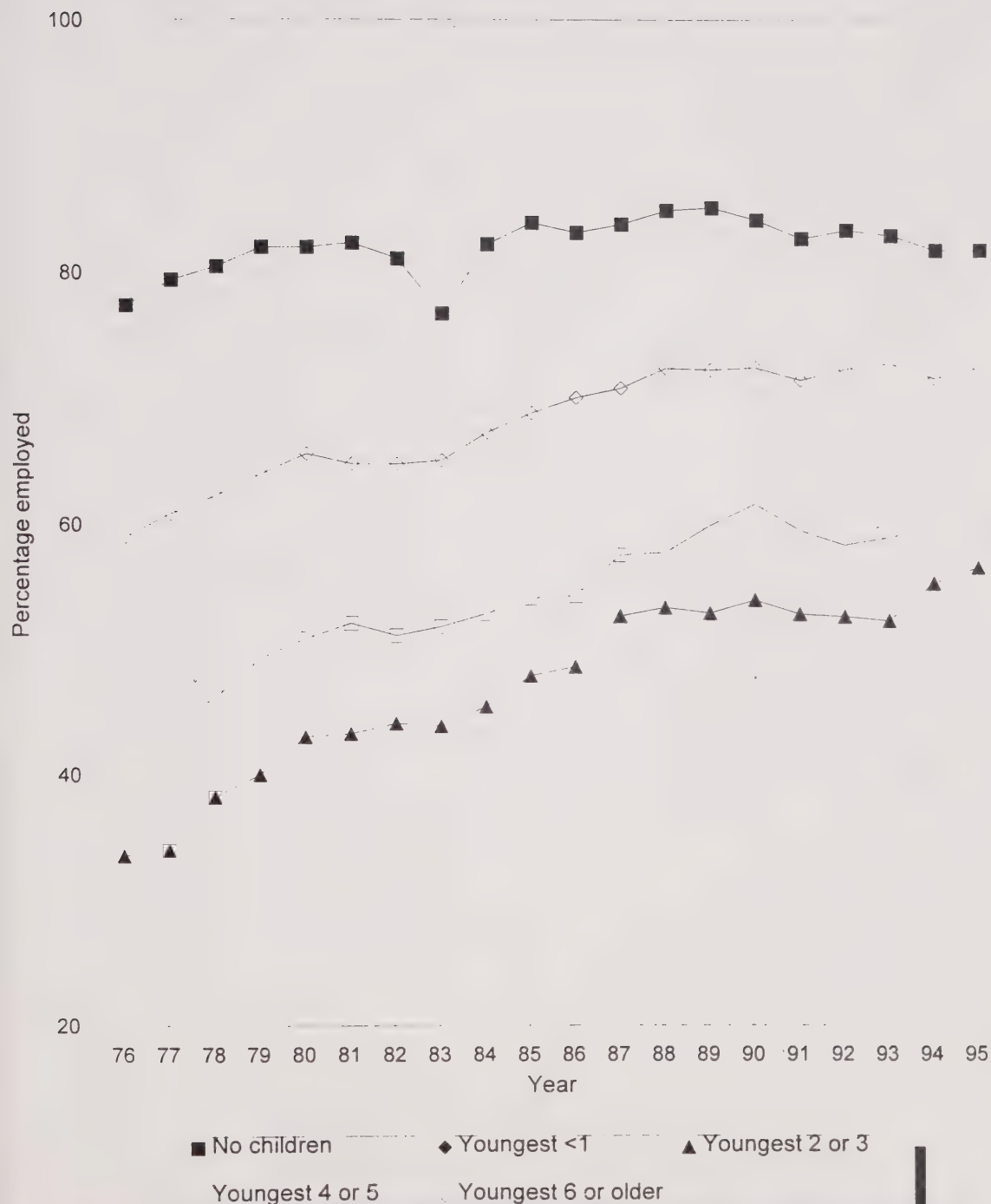


Figure 3: Percentage of Women Employed by Marital Status.

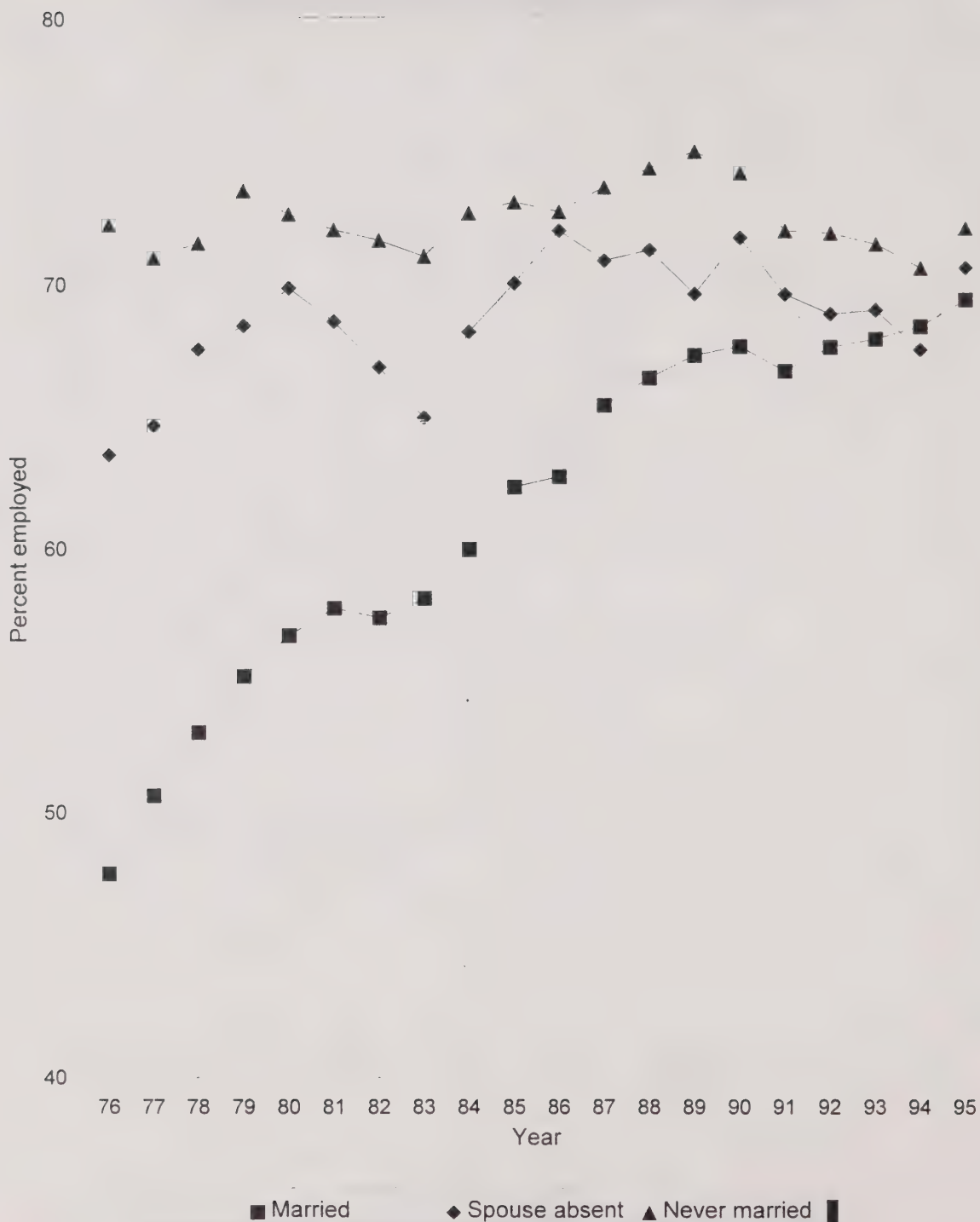




Figure 4: Work vs. Employment Exits of Women.

30

25

20

15

10

76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95  
Year

■ Exited from employment. ♦ Exited from work.

A woman is defined as employed if she worked or was on leave in week prior to survey.



Figure 5: Women's Work Exit Rates by Age of Youngest Child.

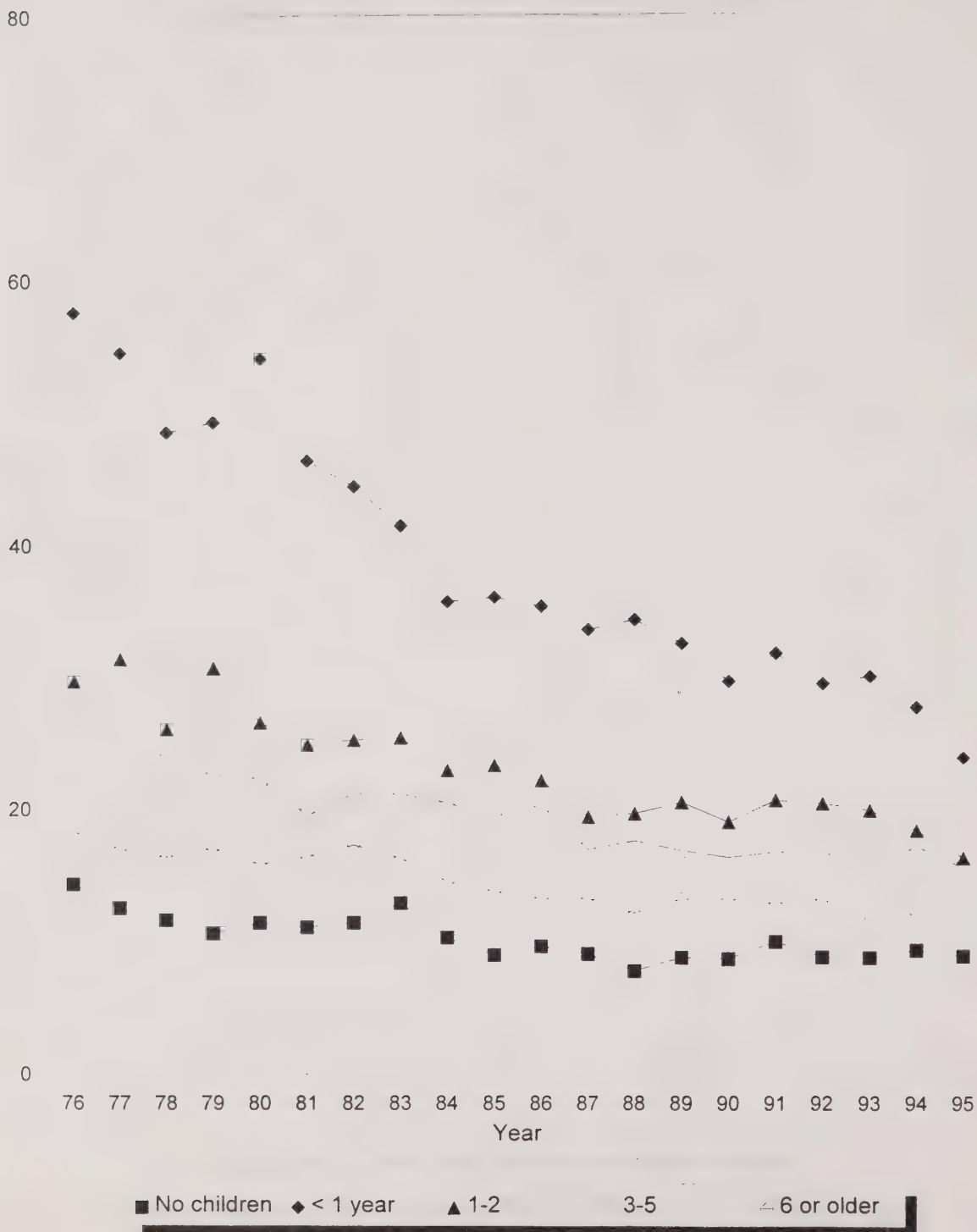
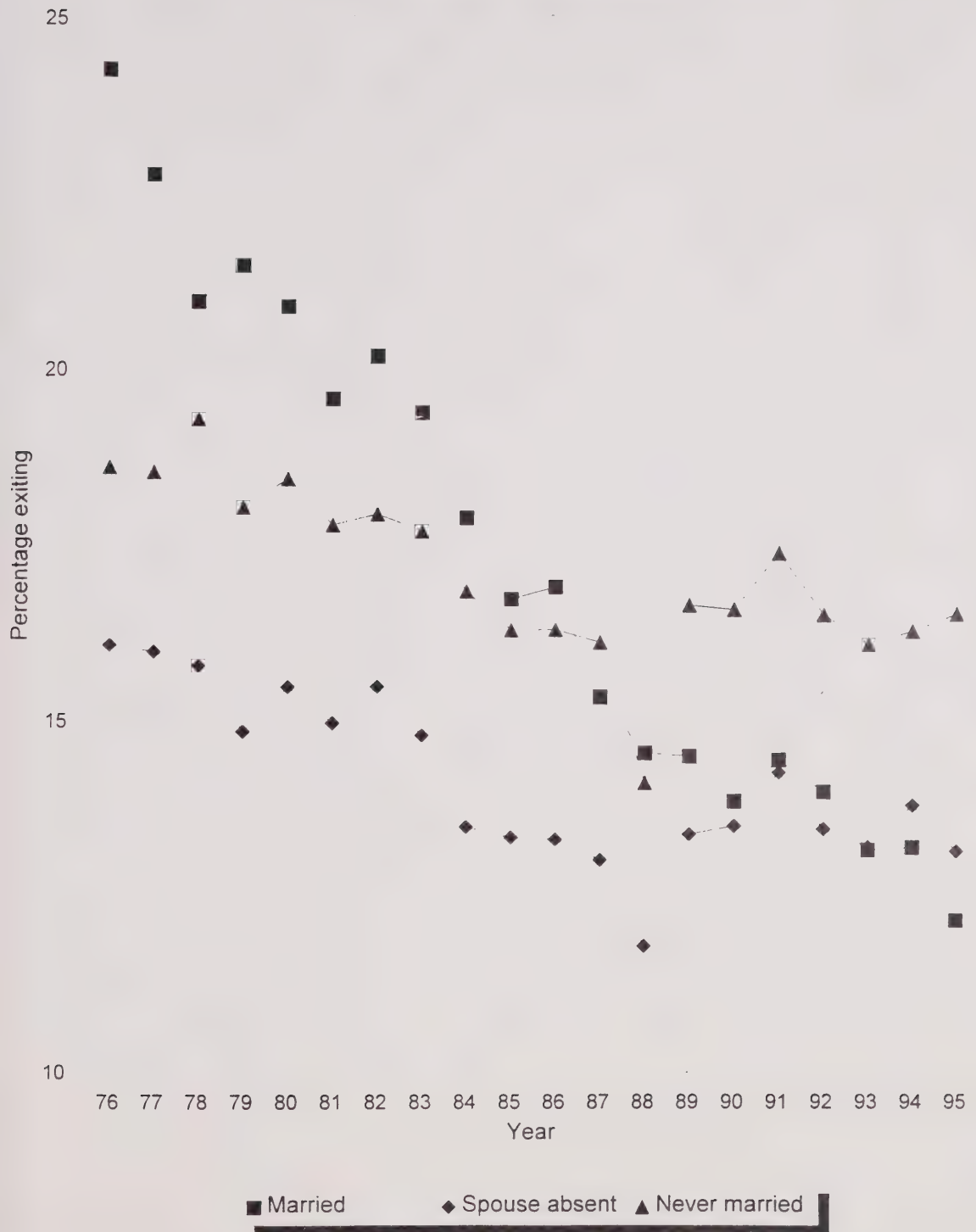


Figure 6: Work Exit rates by marital status.





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**Changes in Working Time in Canada and the United States.  
June 13-15, 1996  
Ottawa, Canada**

## **Session 4B (iii)**

### **The Dynamics of Part-Time and Full-Time Labour: Evidence from Canadian Flows Data**

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Simon Fraser University

Preliminary: Not to be quoted or cited without prior permission of the author(s).

Conference presented by:  
**The Canadian Employment Research Forum (CERF)**  
in cooperation with:  
**Human Resources Development Canada,  
Statistics Canada, and the  
W.E. Upjohn Institute for Employment Research.**





The data and results presented in this paper are preliminary. Please do not quote without permission.

**The Dynamics of Part-time and Full-time Labour: Evidence  
from Canadian Worker Flows Data**

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and  
Jane Friesen**

**Simon Fraser University**

**May 1996**

Prepared for the Conference on Changes in Working Time in Canada and the United States, sponsored by the Canadian Employment Research Forum, Statistics Canada, and the W.E. Upjohn Institute for Employment Research, June 13-15, Ottawa.



## I. Introduction

The literature on gross labour market flows has generated a picture of the labour market as a very dynamic place with large amounts of turnover taking place, well in excess of what is required to achieve net changes in employment. The purpose of this paper is to characterize the nature and properties of gross flows of part-time and full-time workers into and out of employment in order to provide some insights into the relative nature of part-time work in the Canadian labour market and the particular role it may play in aggregate labour market adjustment.

The gross worker flows data that we have constructed from the Canadian Labour Market Activity Survey from 1986 to 1990 measure all hiring, quits and layoffs that take place in each month for both part-time and full-time workers. In the terms that have become familiar in the gross flows literature, these worker flows measure both job creation and destruction at the firm level and churning of workers within firms.<sup>1</sup> The transitions that we are analyzing are very different from the gross flows data analyzed by Jones (1993) and Jones and Riddell (1996), although we use similar methods. Those papers look at transitions between states of employment, unemployment and out of the labour force. We consider transitions into and out of *jobs*. In doing so we extend the work initiated by a number of researchers, primarily at Statistics Canada, that have worked extensively with similar data (see references below).

Part-time workers may have relatively high aggregate rates of turnover for three reasons. First, as Blank (1994) shows, part-time work often plays a particular role in the

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<sup>1</sup> We use the term churning as it is used by Burgess, Lane and Stevens (1995) to refer to the hiring and separation of workers that takes place without changing the employment level of the firm, as worker/firm matches form and dissolve.

life-cycle labour supply behaviour of women, providing women with a temporary alternative to full-time work or being out of the labour force. Second, various authors have suggested that part-time work may play a particular role on the demand side of the market, providing firms with flexibility in scheduling hours and perhaps with varying employment levels (see, for example, Friesen, 1996). Third, part-time work may be concentrated in sectors that have relatively high rates of turnover.

A number of previous studies provide evidence of differences in the turnover behaviour of part-time and full-time workers. The literature most closely related to this work is a series of papers which examines similar gross flows data from the LMAS for a single year. Morissette, Picot and Pyper (1992) use monthly flows data from the 1988 LMAS to show that part-time workers are almost twice as likely to quit as full-time workers. Galarneau (1992) shows that a disproportionate and highly seasonal share of hiring is into part-time jobs.

Christofides and McKenna (1996) include a part-time dummy variable when estimating employment duration models using LMAS data from various years, and find that part-time jobs have substantially shorter expected durations than full-time jobs. This finding accords with evidence from the Labour Force Survey that part-time jobs have lower average tenure than full-time jobs in cross-sectional tenure distributions. Neither of these sources of evidence makes a distinction between quits and lay-offs, however.

In this paper, we characterize more fully the differences between the levels and rates of hiring, lay-off and quit flows of part-time and full-time workers. The five-year monthly time-series we have constructed allows us to investigate more formally than previous authors the



seasonality of these flows. Finally, although the sample period is only five years, we are able to estimate the relationships between each of our flow series and a measure of the business cycle.

## II. The Data

The data used in this paper were constructed from weighted counts of weekly transitions in the LMAS micro data. Transitions are categorized as hires, layoffs, quits, or other separations. The coding rules used to identify quits, layoffs and other separations is provided in the Data Appendix. Temporary work interruptions are not included in these counts. Temporary layoffs are excluded from the layoffs counts and recalls from temporary layoffs are excluded from the hiring counts.<sup>2</sup>

Jobs are categorized as full-time or part-time according to whether or not the worker was usually employed for fewer or more than 120 hours per month. This definition differs from the more usual definition of part-time work as jobs requiring fewer than 30 hours per week. In choosing our definition we hope to capture cases of job sharing where, for example, two workers share a full-time job by working alternate weeks. From the firm's point of view this is a full-time position, while from the worker's point of view it is a part-time position. Since we are examining the behaviour of worker flows, we decided to take the worker's point of view when choosing our definition of part-time work.

The raw weekly flows data were aggregated to monthly flows by summing the weekly flows. Flows during weeks that

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<sup>2</sup> Including temporary layoffs and subsequent recall would increase the turnover measures substantially, although it is not clear how their inclusion would alter the relative magnitudes of part-time and full-time flows. This approach is consistent with that taken by previous researchers.

straddled two months were apportioned to the adjacent months according to the number of days in the week that fall in each. The monthly flows were then converted into flow rates by dividing each by total employment for each category of worker. The monthly employment data used as the denominator were also generated from the LMAS micro data.

The two sets of weights, one for the 1986-87 LMAS file and one for the 1988-90 LMAS file, were used to compute the flows in the corresponding years. The weights provided in the data files are constant within each of these two time periods. The use of piece-wise constant weights eliminates any trend growth in employment and flow levels within each of the two sub-periods that is the result of population growth. However, trends in flow rates found in the data should provide an accurate representation of actual trends in spite of the fixed nature of the weights.

As noted elsewhere (Christofides and McKenna, 1996), there are a large number of hires in the first week of January 1990 that appear to be the result of coding error. We have dealt with this problem in two ways. When plotting the data we replaced the actual hiring figure with one that fell within a reasonable range in the context of the seasonal pattern for other years. In the regressions reported below we included a dummy variable for the first week of January 1990 in the hiring equations.

### **III. Empirical Results.**

Table 1 confirms the findings of previous authors and provides some additional insights. Between 1986 and 1990, the share of part-time workers in paid employment in our data rose from 17.6 percent to 19.6 percent. As the first panel of Table 1 shows, part-time work accounted for a disproportionate share of total turnover in the economy, as much as 31 percent of annual hiring and separations.

The second and third panels of Table 1 provide the same numbers for the manufacturing and service sectors. Part-time employment was between 4 and 6 percent of total employment in manufacturing. The share of part-time employment in manufacturing hiring, lay-offs and quits was as much as three times as high. Part-time work accounted for between 22 and 25 percent of employment in the service sector, and half again as much of total hiring, lay-offs and quits.

Figures 1 to 3 present plots of the raw monthly flows data for hiring, lay-offs and quits respectively of part-time and full-time workers. Visual inspection reveals that both part-time and full-time hiring series have a pronounced seasonal pattern. The seasonal pattern is quite stable in the case of full-time workers but appears to be less pronounced in the last two years of the part-time series. Quits too are highly seasonal. The late summer peak in full-time quits is considerably more pronounced in the last three years of the sample. Most notable about the lay-off series are the huge troughs in both part-time and full-time lay-offs at the end of 1989 and particularly of 1988. We have some concern that these troughs are too deep to be believable and may reflect another set of coding errors in the LMAS. Our comparison of part-time and full-time lay-off behaviour are unlikely to be affected too seriously if this is the case, given that the same pattern appears in both series.

Since part-time work accounts for a relatively small percentage of employment in the sample, comparisons between part-time and full-time flows are most easily made by considering flow rates. Table 2 presents essentially the same information as Table 1 in a different form: annual flow levels and rates of hiring, quits and lay-offs for each type

of worker in each of the five years of the sample.<sup>3</sup> The quit rate is much higher than the lay-off rate for both groups of workers. As reported earlier for the year 1988 by Morisette et. al.(1992), the part-time quit rate is almost twice as high as the full-time quit rate. The part-time lay-off rate is also considerably higher than the full-time lay-off rate, although the difference is not quite as great. Quits are therefore a greater proportion of part-time separations than of full-time separations.

The hiring rates in the first panel of Table 2 reflect the differences in the separation rates: hiring rates of part-time workers are greater than of full time workers. The hiring rate of part-time workers is particularly high in 1986 and 1988, although these are not the years with the greatest rates of part-time separations.<sup>4</sup>

Tables 3 and 4 present the same data for the manufacturing and service sectors. In services, the quit rate of part-time workers is about 1 1/2 times as high as the quit rate of full-time workers. The part-time layoff rate is still higher than the full-time layoff rate, but the difference is quite small, particularly in 1989 and 1990. The hiring rate of part time workers likewise is higher than of full-time workers.

Turnover in manufacturing is quite different from turnover in services. Full-time workers in manufacturing tend to exhibit lower quit and lay-off rates than

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<sup>3</sup>The annual rates are computed as total yearly flow over employment at the beginning of the year (i.e. last full week in December).

<sup>4</sup>The difference between hiring and separation rates is the sum of other separations not classified as quits and lay-offs (see Appendix 1 for coding rules) and net employment growth.



services. Part-time workers exhibit higher quit rates in manufacturing than in services, and quite considerably higher lay-off rates.<sup>5</sup> Thus the differences between turnover of part-time and full-time workers is considerably greater. The higher separation rate of part-time workers in manufacturing corresponds to a much higher rate of hiring, particularly in 1986 and 1988, when more part-time workers were hired over the year than were employed in the previous December.

### **Seasonal Component of Flows**

Figures 1 through 3 show that all levels series exhibit considerable seasonality, although not all transitions into and out of seasonal jobs and temporary lay-offs are captured in these data. We investigated these seasonal patterns by regressing each of the flow levels on a constant and eleven monthly dummy variables.

The estimated seasonal coefficients are plotted in Figure 4 for the aggregate data and in Figure 5 for the manufacturing data. The seasonal peaks in the aggregate data tend to coincide for part-time and full-time workers in most cases. The general pattern is very similar for quits and somewhat different for hires and layoffs. Quits are at their highest in August for both groups, and at their lowest in November. Lay-offs peak in December for both part-time and full-time workers, and are at their lowest point in February. As found previously by Galarneau (1992) using data from 1988, full-time hiring is at its highest point in June, whereas part-time hiring is maximized in September. These differences are probably associated with the behaviour of students. Hiring of both part-time and full-time workers is lowest in December.

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<sup>5</sup> Picot (1992) reports that the lay-off rate in manufacturing in 1988 exceeded the aggregate lay-off rate. We find that this is the case only for full-time workers.

Once again, the manufacturing sector looks somewhat different from the service sector, which in turn dominates the aggregate data (Figure 5). While full-time quits still peak in August, part-time quits now peak in June. The seasonal behaviour of lay-offs exhibits a similar pattern to the rest of the economy, peaking in December for both groups. Hiring of both part-time and full-time workers peaks in June in the manufacturing sector.

Table 5 presents the proportion of the total variance of each series that is accounted for by the seasonal component, computed as its predicted value from the regression on the monthly dummies. With one exception the proportion of the variance of the part-time flows that is seasonal is considerably lower than the corresponding full-time flow. The most noticeable case is quits. As Table 5 shows, 84 percent of the variance of full-time quits in the total sample is accounted for by its seasonal component, compared to only 57 percent of the variance of part-time quits. This pattern is similar in the service sector. Quits in manufacturing are less seasonal in the case of both part-time and full-time workers than in the rest of the economy.

The exception to the rule that the part-time flows are less dominated by seasonality than the full-time flows is the case of lay-offs in the manufacturing sector. Part-time lay-offs is also the only case where the proportion of seasonality in manufacturing exceeds that in services. Within manufacturing, 42 percent of part-time workers and 24 percent of full-time workers are employed in food and beverage processing. The different seasonal patterns of part-time and full-time lay-offs may reflect the seasonality of this industry.

#### **Non-seasonal Component of Flows**



The non-seasonal component of the flows, defined as the residuals from the seasonal regressions plus an average of the twelve monthly effects, turned out to be quite noisy. We aggregated the monthly data to quarterly in order to reduce the noisiness of the series and bring out more clearly any consistent pattern in the data. On such a short sample, only factors expected to have short-term impacts may be considered. The obvious candidate is aggregate demand. Fortunately, the period under investigation, 1986-1990, covers a peak in the business cycle (1988). Furthermore, by 1990, real GDP growth was negative. Figures 6 to 8 present plots of the deseasonalized quarterly flows.

Deseasonalized hiring declines precipitously at the end of 1986, increases through 1987, peaks at the same time as the business cycle at the beginning of 1988, and then begins a clear decline. Deseasonalized quits follow an upward trend until the beginning of 1990, when they begin to decline, sharply in the case of manufacturing. Deseasonalized lay-offs exhibit a complex pattern in the aggregate data and in services but rise sharply in late 1989. Manufacturing lay-offs are trending upwards throughout the sample and rise quite precipitously in late 1989.

In order to investigate these features more thoroughly, we estimated the following specification:

$$\ln f_t = a_0 + a_1 \ln f_{t-1} + a_2 AD_t + a_3 AD_{t-1} + a_4 \text{time} + \varepsilon_t$$

where  $f$  is a flow and  $AD$  is a measure of the business cycle.<sup>6</sup> The six flow equations (hires, layoffs and quits for full-time and part-time workers respectively) for each sample were estimated jointly by generalized least squares to take into account any non-zero covariance of the errors

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<sup>6</sup> The business cycle measure is detrended Real Gross Domestic Product from the following estimation over the

across different flow equations. When the lagged variables were not significant, the more concise specification was used. The Breush-Pagan LM test for first-order correlation in the residuals is also provided. Tables 6 through 8 present the estimated coefficients on the business cycle variable and the time trend for aggregate, manufacturing and services flows respectively.

Beginning with the aggregate data, both hires and quits are strongly cyclical. Only contemporaneous aggregate demand is significant in the hiring equations, whereas both contemporaneous and one-period lagged aggregate demand are significant in the quits equations. The point estimates suggest that quits are somewhat more sensitive to business cycle conditions than hiring.

Standard dynamic labour demand models with linear adjustment costs predict that firms will adjust employment through attrition and reductions in hiring around demand peaks and troughs, and will use lay-offs only in the intermediate stages of demand cycle (Bertola, 1992). Although inferences about the timing of the adjustment process must be made cautiously given the short time series we have available, these results do suggest that quits respond more slowly to changes in business cycle conditions than does hiring. Lay-offs do not appear to respond either to contemporaneous or lagged aggregate demand. One can speculate that firms may postpone relatively costly lay-offs, instead using hours reductions and attrition to reduce their labour forces in the short-run, as theory predicts.

The aggregate demand elasticity of the part-time series exceeds that of the full-time series in every case. However, formal tests of their equality failed to reject the

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period 1973.1 to 1994.4,  $\ln \text{RGDP}_t = 11.286 + 0.0103 \cdot \text{time} - 0.00004 \cdot \text{time}^2$ . Seasonal dummies were included.

null in any case: the part-time flows are not statistically significantly more responsive to our business cycle measure.

Similar estimation for the manufacturing and service sectors produce similar results: hires and quits are both highly responsive to aggregate demand but there is no significant difference between the responsiveness of the part time and full time flows. However, the manufacturing quit and hiring flows are all significantly more responsive to aggregate demand than the services flows.

#### **IV. Discussion**

The results presented in this paper provide an overall view of both the level of worker turnover in the Canadian economy and the relative share of part-time work in aggregate turnover. We confirm previous evidence of very high rates of worker turnover found by other authors. We also confirm the disproportionate share of part-time workers in total quits found by Picot et. al. and of hires found by Galarneau. We further find that part-time workers are involved in a disproportionate share of total lay-offs in the labour market.

The share of seasonal variation in the total variation of part-time worker flows is smaller than that of full-time worker flows. The variation not explained by seasonal dummies may be the result of trends or cyclical behaviour. Another possibility is that there is simply more noise in the part-time series because they are generated from fewer observations increasing their sampling error.

Our investigation of the cyclical components of the aggregate flows revealed little significant difference between part-time and full-time series, although the point estimates indicate that part-time flows are more cyclically

sensitive in general. Part time and full-time quits and hiring are all cyclically sensitive. Over the range of business cycle conditions that we observe in our short sample, both part-time and full-time layoffs are equally cyclically insensitive. Hiring rates appear to respond most rapidly to changes in aggregate demand, followed by quits. This finding suggests that firms respond to downturns first by cutting back on hiring and reducing employment through attrition of part-time and full-time workers, to the same degree.

The service sector flows have the same characteristics as the aggregate flows, but the manufacturing sector differs in several dimensions. The disproportionate nature of the share of part-time workers in total turnover is greater in manufacturing than in services and in the aggregate data, and it is more cyclically sensitive. Part-time lay-offs in the manufacturing sector are more highly seasonal than full-time lay-offs. These findings may reflect the different industrial distributions of part-time and full-time workers within manufacturing or it may be indicative of a particular role played by part-time workers in employment adjustment.

Together these results confirm the common perception that part-time work is more unstable than full-time work in the aggregate. The instability is being generated on both the supply side of the market through higher quit rates and on the demand side of the market through higher lay-off rates. Perhaps surprisingly, the relative instability of part-time work has few distinguishing seasonal or cyclical features, except in the manufacturing sector. This finding suggests that part-time workers do not play any particular role in adjusting to seasonal and cyclical shocks at the macro level.



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## Data Appendix

### Coding Rules for the Transition Data

A termination is coded as a quit if the reason for the job ending is given as:

- A own illness or disability
- B personal or family responsibilities
- C going to school
- I found a new job
- J working conditions
- L low pay
- N changed residence
- P retired
- Q no opportunity for advancement
- R worried about job security/reduction in working hours

A termination is coded as a lay-off if the reason for the job ending is given as:

- D seasonal nature of job
- E end of temporary non-seasonal job
- F non-seasonal economic or business conditions
- K an on-call arrangement
- M dismissal by the employer
- O company moving or going out of business

Residual category:

- G labour dispute
- H unpaid vacation
- S other

Note: There are no pages numbered 15 and 16. Paper is complete.

Table 1

## PART-TIME SHARE: TOTAL

	HIRES	TOTAL SEPARAT.	LAYOFFS	QUITS	PAID EMPLOYM. <sup>a</sup>
1986	29.4	28.0	28.5	27.8	17.6
1987	27.9	29.0	26.9	30.5	18.3
1988	31.3	30.6	28.1	31.8	19.4
1989	28.8	28.5	24.4	30.3	19.6
1990	28.0	27.0	20.5	30.9	19.6

## PART-TIME SHARE: MANUFACTURING

	HIRES	TOTAL SEPARAT.	LAYOFFS	QUITS	PAID EMPLOYM. <sup>a</sup>
1986	13.5	14.4	16.2	13.2	4.6
1987	11.0	16.5	16.3	16.7	4.7
1988	16.1	14.3	12.1	15.4	6.4
1989	11.1	11.9	10.4	12.6	6.0
1990	14.3	12.9	13.0	12.9	5.9

## PART-TIME SHARE: SERVICES

	HIRES	TOTAL SEPARAT.	LAYOFFS	QUITS	PAID EMPLOYM. <sup>a</sup>
1986	33.8	32.2	32.1	32.2	22.7
1987	32.7	34.2	32.3	35.3	23.1
1988	35.6	35.0	32.1	36.2	24.6
1989	33.5	33.4	29.2	35.0	24.6
1990	32.2	31.6	24.3	35.3	24.6

<sup>a</sup> Average employment over the year.

Table 2

## YEARLY TOTAL FLOWS AND RATES

	HIRES			
	<i>Full-Time</i>		<i>Part-Time</i>	
	Level	Rate <sup>a</sup>	Level	Rate <sup>a</sup>
1986	3,757,126	0.465	1,563,195	0.952
1987	2,974,253	0.335	1,151,296	0.546
1988	4,026,149	0.472	1,835,321	0.947
1989	3,287,370	0.380	1,328,072	0.592
1990	3,215,846	0.397	1,248,519	0.637

	QUITS			
	<i>Full-Time</i>		<i>Part-Time</i>	
	Level	Rate <sup>a</sup>	Level	Rate <sup>a</sup>
1986	1,533,404	0.190	590,819	0.360
1987	1,822,542	0.205	798,970	0.379
1988	2,207,988	0.259	1,028,507	0.531
1989	2,112,810	0.244	920,001	0.410
1990	1,954,271	0.241	873,743	0.446

	LAYOFFS			
	<i>Full-Time</i>		<i>Part-Time</i>	
	Level	Rate <sup>a</sup>	Level	Rate <sup>a</sup>
1986	791,218	0.098	315,223	0.192
1987	1,317,812	0.148	485,653	0.230
1988	1,083,226	0.127	424,273	0.219
1989	1,032,049	0.119	332,210	0.148
1990	1,356,858	0.167	349,743	0.178

<sup>a</sup> Total annual flow over employment at the beginning of the year (i.e. last full week in Dec.).

	SEPARATION RATE		PAID EMPLOYMENT <sup>b</sup>		REAL GDP GROWTH	UNEMP. RATE
	<i>Full-Time</i>	<i>Part-Time</i>	<i>Full-Time</i>	<i>Part-Time</i>		
1986	0.288	0.552	8,080,886	1,642,243	3.3	9.5
1987	0.353	0.609	8,883,863	2,108,020	4.1	8.9
1988	0.386	0.749	8,526,395	1,938,681	4.9	7.8
1989	0.363	0.558	8,660,735	2,243,720	2.4	7.5
1990	0.408	0.624	8,109,485	1,959,777	-0.2	8.1

<sup>b</sup> Measured at the beginning of the period. 1986=first full week in January; 1987, 1988, 1989, 1990=last full week in December of the preceding year.

	SHARE OF QUILTS IN TOTAL SEPARATIONS	
	<i>Full-Time</i>	<i>Part-Time</i>
1986	66.0	65.2
1987	58.0	62.2
1988	67.1	70.8
1989	67.2	73.5
1990	59.0	71.4



Table 3

## YEARLY MANUFACTURING FLOWS AND RATES

	HIRES			
	<i>Full-Time</i>		<i>Part-Time</i>	
	Level	Rate <sup>a</sup>	Level	Rate
1986	646,913	0.363	100,811	1.364
1987	531,990	0.274	65,641	0.637
1988	708,294	0.361	135,931	1.152
1989	513,717	0.267	63,844	0.473
1990	389,878	0.207	64,916	0.546

	QUITS			
	<i>Full-Time</i>		<i>Part-Time</i>	
	Level	Rate <sup>a</sup>	Level	Rate
1986	215,841	0.121	32,767	0.443
1987	227,376	0.117	45,488	0.442
1988	389,698	0.208	70,982	0.636
1989	399,650	0.208	57,772	0.428
1990	294,910	0.156	43,600	0.367

	LAYOFFS			
	<i>Full-Time</i>		<i>Part-Time</i>	
	Level	Rate <sup>a</sup>	Level	Rate
1986	137,175	0.077	26,599	0.360
1987	192,661	0.099	37,534	0.364
1988	202,212	0.108	27,945	0.250
1989	197,647	0.103	23,027	0.170
1990	281,819	0.149	41,933	0.353

<sup>a</sup> Total annual flow over employment at the beginning of the year (i.e. last full week of Dec.).

	SEPARATION RATE		PAID EMPLOYMENT <sup>b</sup>		REAL GDP GROWTH	UNEMP. RATE
	<i>Full-Time</i>	<i>Part-Time</i>	<i>Full-Time</i>	<i>Part-Time</i>		
1986	0.198	0.803	1,780,511	73,911	3.3	9.5
1987	0.217	0.806	1,939,897	102,990	4.1	8.9
1988	0.317	0.886	1,869,409	111,630	4.9	7.8
1989	0.310	0.598	1,923,740	135,115	2.4	7.5
1990	0.306	0.720	1,886,525	118,819	-0.2	8.1

<sup>b</sup> Measured at the beginning of the period. 1986=first full week in January; 1987, 1988, 1989, 1990=last full week in December of the preceding year.

	SHARE OF QUILTS IN TOTAL SEPARATIONS	
	<i>Full-Time</i>	<i>Part-Time</i>
1986	61.1	55.2
1987	54.1	54.8
1988	65.8	71.8
1989	66.9	71.5
1990	51.1	51.0

Table 4

## YEARLY SERVICE FLOWS AND RATES

	HIRES			
	<i>Full-Time</i>		<i>Part-Time</i>	
	Level	Rate <sup>a</sup>	Level	Rate
1986	2,568,287	0.489	1,313,850	0.889
1987	2,060,380	0.361	1,001,317	0.552
1988	2,769,319	0.527	1,531,325	0.928
1989	2,312,689	0.409	1,165,302	0.608
1990	2,283,015	0.394	1,085,081	0.560

	QUITS			
	<i>Full-Time</i>		<i>Part-Time</i>	
	Level	Rate <sup>a</sup>	Level	Rate
1986	1,105,103	0.210	525,200	0.355
1987	1,303,266	0.228	711,427	0.392
1988	1,566,424	0.298	886,954	0.538
1989	1,492,177	0.264	805,106	0.420
1990	1,426,778	0.246	779,484	0.402

	LAYOFFS			
	<i>Full-Time</i>		<i>Part-Time</i>	
	Level	Rate <sup>a</sup>	Level	Rate
1986	520,645	0.099	245,909	0.166
1987	826,905	0.145	394,981	0.218
1988	690,380	0.131	327,054	0.198
1989	652,706	0.116	268,778	0.140
1990	859,217	0.148	275,439	0.142

<sup>a</sup> Total annual flow over employment at the beginning of the year (i.e. last full week of Dec.).

	SEPARATION RATE		PAID EMPLOYMENT <sup>b</sup>		REAL GDP GROWTH	UNEMP. RATE
	<i>Full-Time</i>	<i>Part-Time</i>	<i>Full-Time</i>	<i>Part-Time</i>		
1986	0.310	0.522	5,252,180	1,478,359	3.3	9.5
1987	0.373	0.610	5,704,099	1,814,112	4.1	8.9
1988	0.430	0.736	5,251,283	1,649,518	4.9	7.8
1989	0.380	0.561	5,648,598	1,915,654	2.4	7.5
1990	0.395	0.544	5,790,595	1,937,418	-0.2	8.1

<sup>b</sup> Measured at the beginning of the period. 1986=first full week in January; 1987, 1988, 1989, 1990=last full week in December of the preceding year.

	SHARE OF QUILTS IN TOTAL SEPARATIONS	
	<i>Full-Time</i>	<i>Part-Time</i>
1986	68.0	68.1
1987	61.2	64.3
1988	69.4	73.1
1989	69.6	75.0
1990	62.4	73.9

Table 5

## PROPORTION OF TOTAL VARIANCE THAT IS SEASONAL

	Total	Manufact.	Services
<i>Full-Time</i>			
Hiring	.83	.79	.83
Layoffs	.70	.67	.69
Quits	.84	.70	.83
<i>Part-Time</i>			
Hiring	.71	.63	.74
Layoffs	.63	.73	.58
Quits	.57	.50	.55



Table 6

## TOTAL FLOWS AND BUSINESS CYCLE

	Aggregate Demand	Time	R <sup>2</sup>	LM [ $\chi^2(1)$ ] <sup>b</sup>
Hires (ft)	3.590 (2.6)**	-0.024 (6.6)**	0.547	1.714
Hires (pt)	4.887 (2.4)**	-0.028 (5.1)**	0.429	2.018
Layoffs (ft)	-0.576 (0.3)	0.019 (3.4)**	0.261	1.021
Layoffs (pt)	1.851 (0.8)	-0.013 (2.0)*	0.098	0.842
Quits (ft)	5.652 (5.6)** <sup>a</sup>	0.002 (0.6)	0.685	1.214
Quits (pt)	7.123 (3.7)** <sup>a</sup>	0.005 (1.0)	0.508	0.668

Absolute t-values in parentheses.

\*,\*\* Two-tail test, significant at 10% and 5% respectively.

<sup>a</sup> Sum of the coefficients on contemporary and 1-period lagged aggregate demand.

<sup>b</sup> Breush-Pagan test for first-order serial correlation. Critical value:  $\chi^2(1)_{1\%}=6.64$   $\chi^2(1)_{5\%}=3.84$ .

Table 7

## MANUFACTURING, SERVICE FLOWS AND BUSINESS CYCLE

	Aggregate Demand	Time	R <sup>2</sup>	LM [ $\chi^2(1)$ ] <sup>b</sup>
<i>HIRES</i>				
Manufact.(ft)	5.834 (5.1)**	-.037 (11)**	0.795	1.220
Manufact.(pt)	7.764 (2.4)**	-.032 (3.6)**	0.308	1.244
Service (ft)	3.320 (2.3)**	-.022 (5.7)**	0.473	0.698
Service (pt)	4.511 (2.4)**	-.026 (5.0)**	0.422	1.107
<i>LAYOFFS</i>				
Manufact.(ft)	-0.461 (0.3)	.038 (8.7)**	0.711	0.116
Manufact.(pt)	-5.968 (1.6)	.018 (1.8)*	0.132	4.024
Service (ft)	-0.661 (0.3)	.017 (3.3)**	0.244	0.614
Service (pt)	2.041 (0.8)	-.014 (2.0)*	0.103	1.123
<i>QUITS</i>				
Manufact.(ft)	10.93 (6.2)**a	.009 (1.8)*	0.746	3.332
Manufact.(pt)	11.96 (3.8)**	.003 (0.4)	0.473	0.048
Service (ft)	4.187 (4.6)**	.005 (2.0)*	0.641	0.528
Service (pt)	5.508 (3.0)**	.008 (1.6)**	0.452	0.877

See footnotes Table 6.

Figure 1

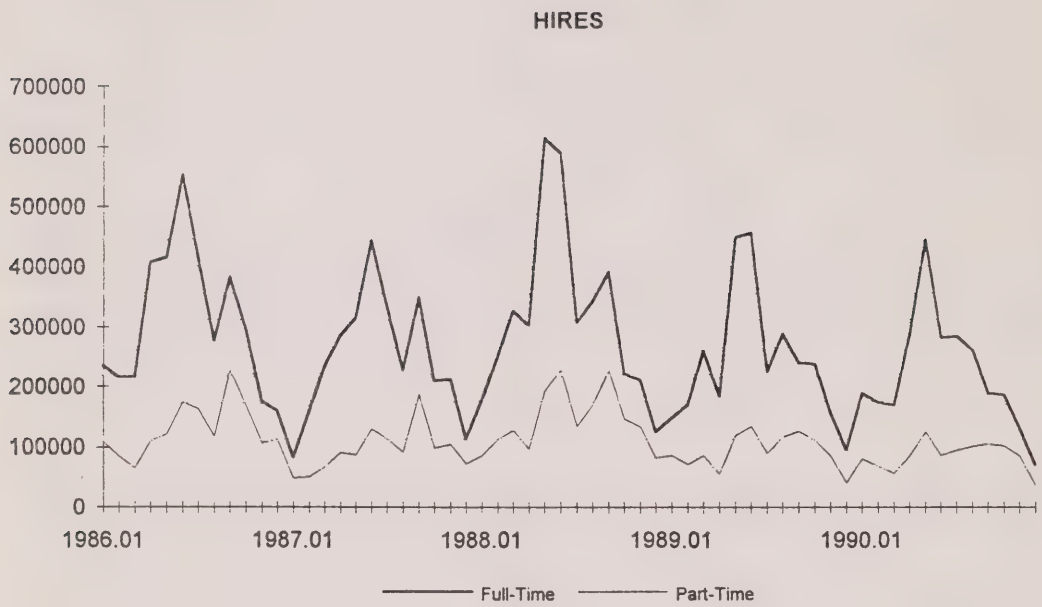


Figure 2

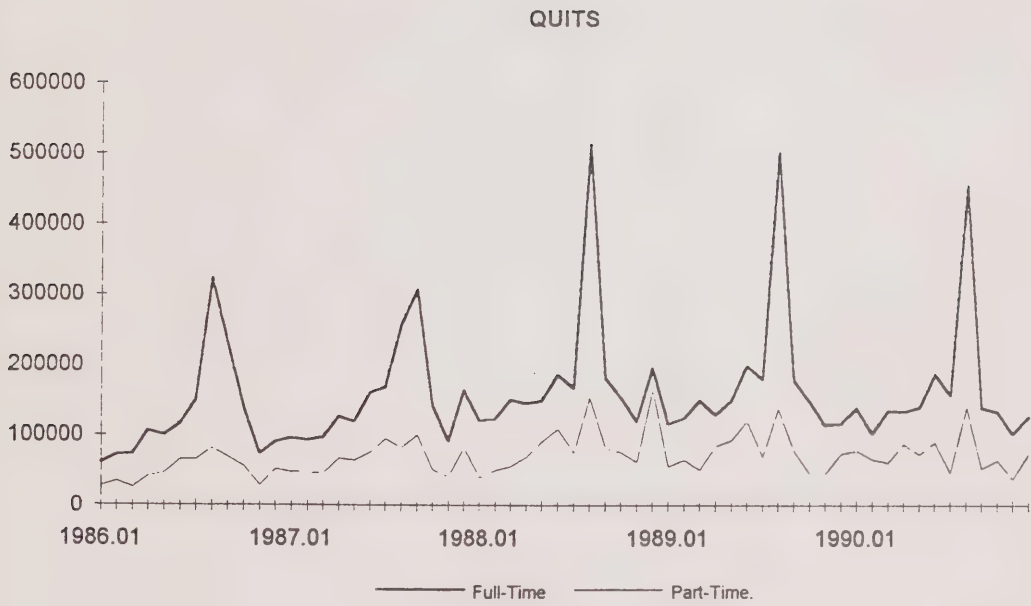


Figure 3

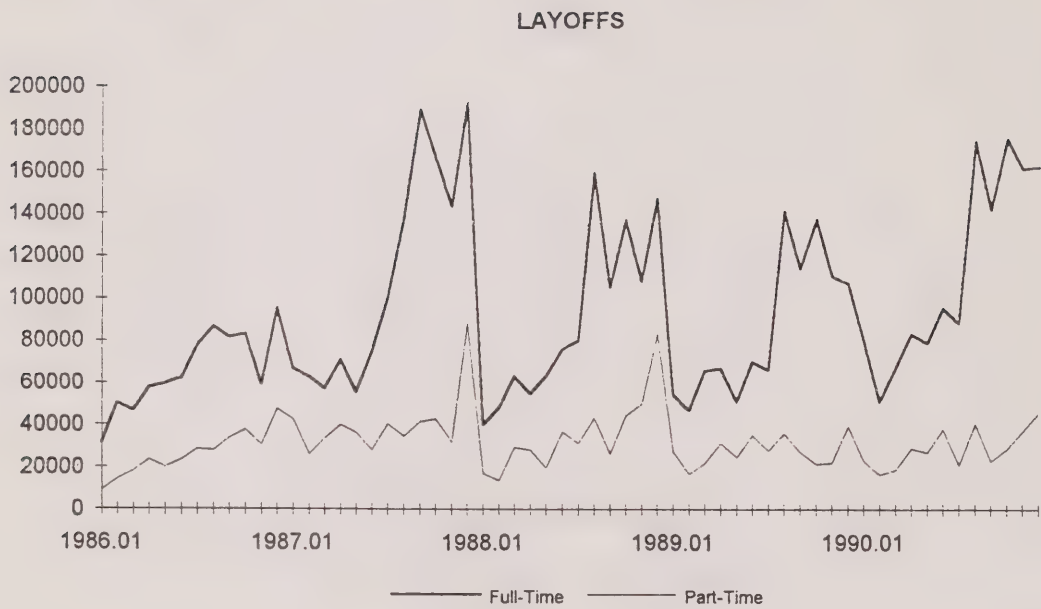


Figure 4

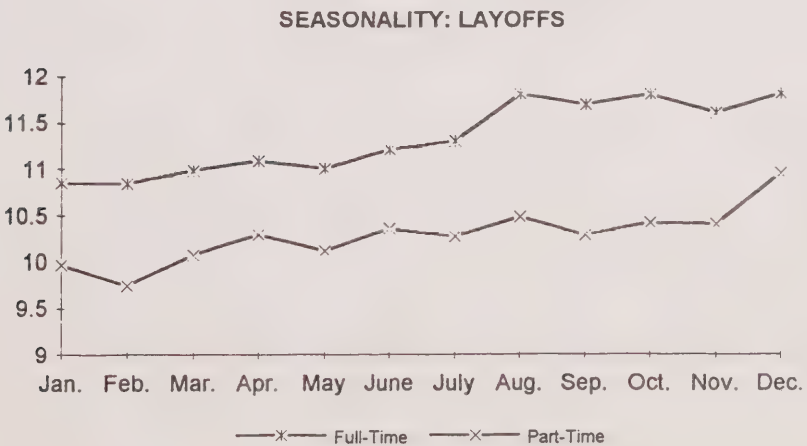
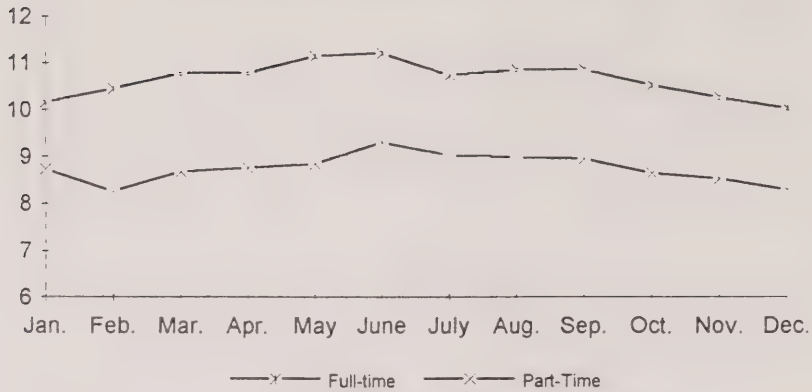


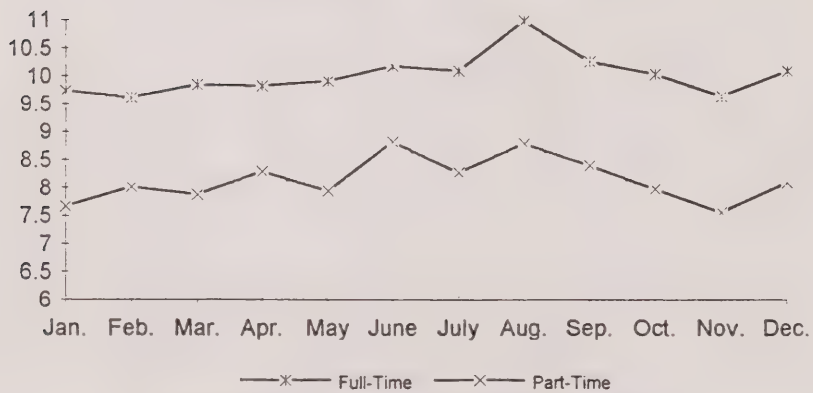


Figure 5

### SEASONALITY: MANUFACTURING HIRES



### SEASONALITY: MANUFACTURING QUILTS



### SEASONALITY: MANUFACTURING LAYOFFS

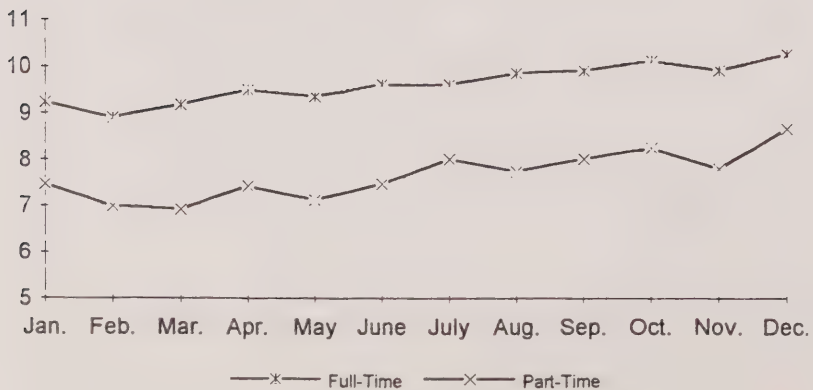


Figure 6

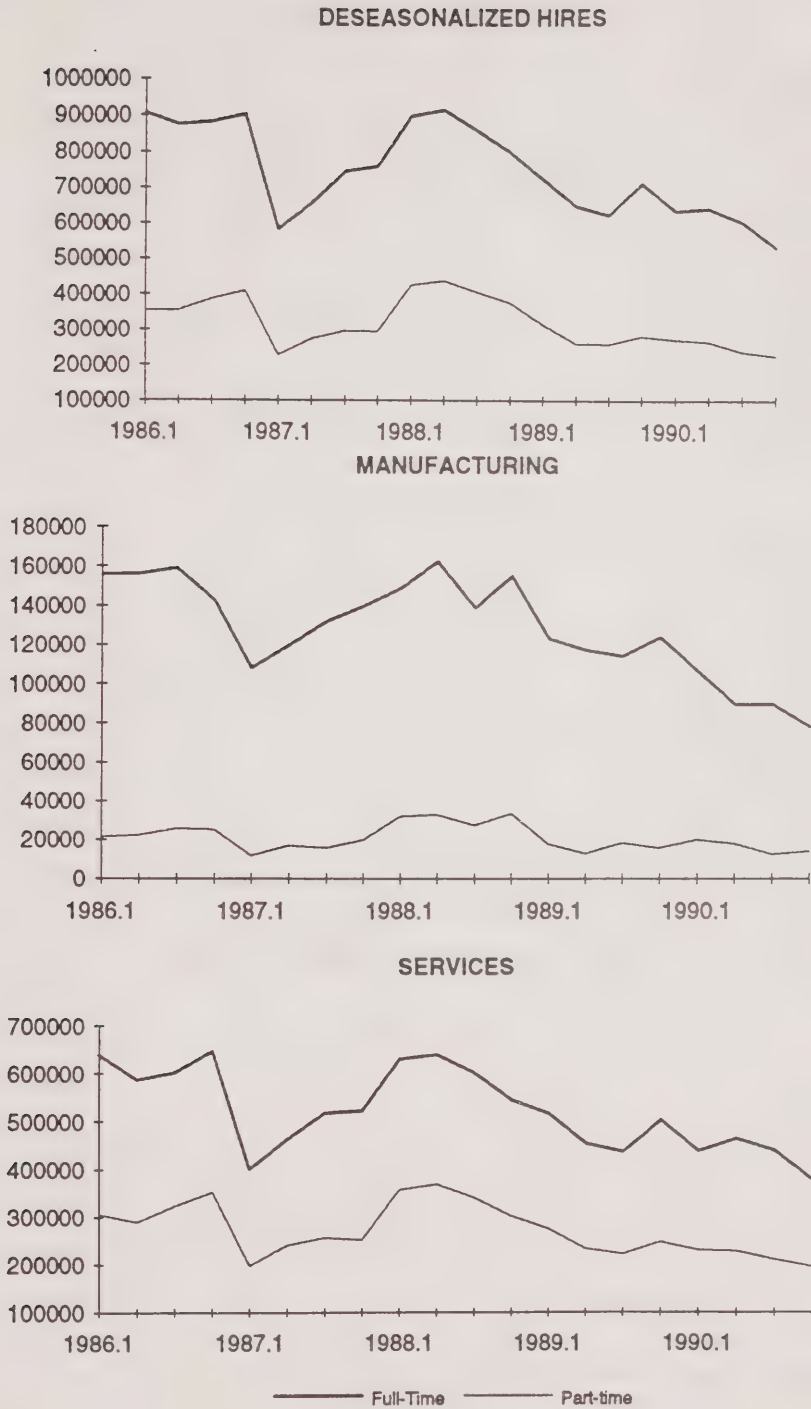
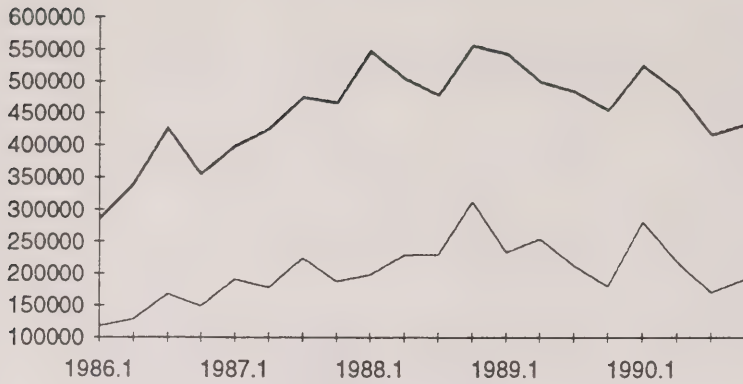
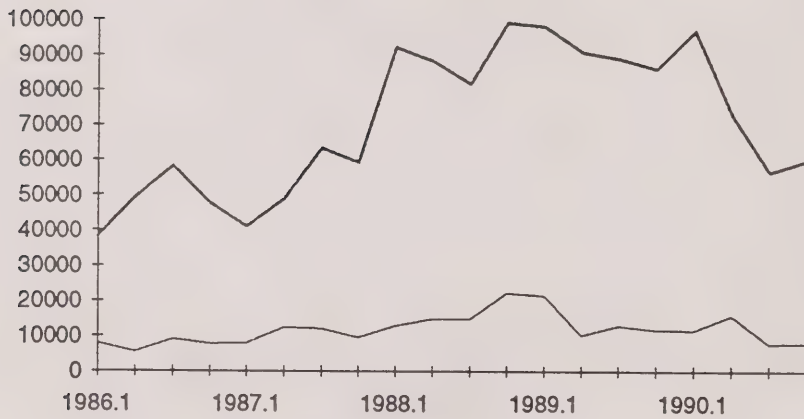


Figure 7

### DESEASONALIZED QUILTS



### MANUFACTURING



### SERVICES

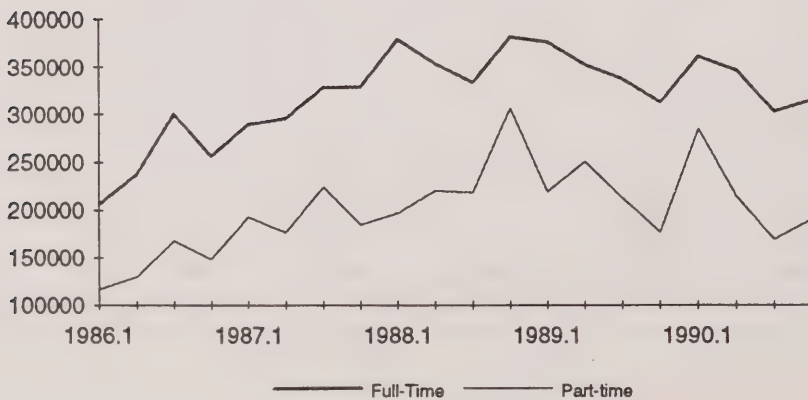
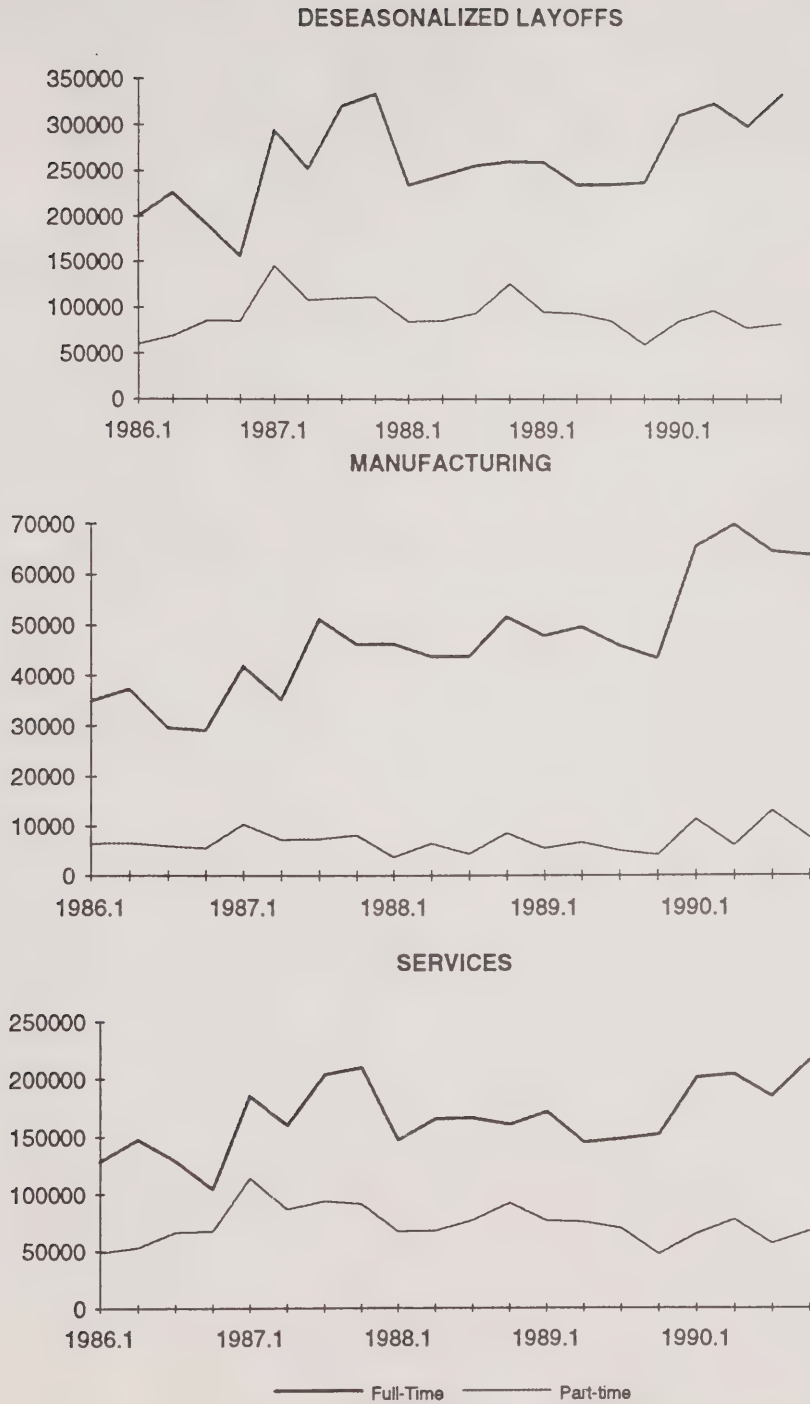


Figure 8





**Changes in Working Time in Canada and the United States.  
June 13-15, 1996  
Ottawa, Canada**

CA1  
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## **Session 2B (i)**

### **The Effects of U.S. and Canadian Health Insurance and Disability Policies on Maternal Labour Supply**

Janet Hunt-McCool  
Georgetown University Medical Center

Preliminary: Not to be quoted or cited without prior permission of the author(s).

Conference presented by:  
**The Canadian Employment Research Forum (CERF)**  
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W.E. Upjohn Institute for Employment Research.**





**US/ Canadian Health Policy:  
Consequences for Mothers of Children  
with Disabilities and Chronic Conditions**



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**Prepared for:  
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**The opinions expressed here are exclusively those of the author. Without implicating, Alan Monheit was instrumental in modelling and in defining the health conditions of children used in this paper.**



## US / Canadian Health Care Policy: The Consequences for Mothers of Disabled Children

*"The most defenseless are women with children, who have become the first candidates for discharge--because of sick children or due to the unwillingness of management, or at times the impossibility due to economic difficulties, to grant them the rights and privileges accorded them by the law." (Shapiro, 1992, referring to mandated employment benefits for mothers in the NIS.)*

*'Did you ever think about getting married again?' Senator Gramm's response to an elderly Black women who said she could not get by with further cuts in Medicare and Social Security. (Franken, 1996)*

### 1. Introduction

In this paper, I explore the relationship between health care systems and the use of time in the US and Canada. The main difference between the two systems, at least in theory, is that access to medical care in the US is often tied to the employment of a family member. Bundling health insurance with employment obviously affects the division between taxed and nontaxed compensation, and less obviously job turnover, promotion ladders, and firm selection of workers. (Some of these issues have been addressed by Ehrenberg, 1983, Woodbury, 1983, Monheit and Vistness, 1996, and Madrian, 1994 among others.) The specific consequence of tying insurance to work that I consider here is the cost to an individual who has especially high opportunity cost of nonmarket time. The empirical example considered is the allocation of time of mothers whose children have disabilities or chronic conditions. Because premiums are indivisible, full time work is but one precondition for employment-based insurance. This requirement may be especially deleterious for such mothers, when children require both expensive medical care and parental time.

At first glance, this problem appears unique to the US. Canada, in theory, has a federal health insurance system, Medicare, that covers all persons independent of work. However, 60% of all Canadians receive some supplementary coverage over and above the basic federal

guarantee now in place. Much of the supplementary insurance is employment-based.

*De facto*, elements of access to care in Canada are beginning to resemble the US model.

To analyze the effects of health insurance options on the use of time, I compare two groups of women both married and single mothers of children with disabilities. The health insurance options facing these mothers in the US include (1) no insurance; (2) Medicaid, a joint federal/state program for some low-income persons; (3) employment-based insurance, often conditional on full-time work and relatively high wages; or (4) marriage to a husband who has family health insurance coverage from his own employer. (For simplicity, the latter is assumed constant.)

To develop the empirical model of time use of these mothers, basic data on gender differences in health status, and the economic status of women in Canada and the US are provided in Section 2. A discussion of key differences in the health insurance systems including coverage and financing is found at this time. Then, in section 3, the economic theory of labor supply under health insurance constraints is developed. In Section 4, an empirical test is specified using US data from the National Medical Care Expenditure Survey (NMES). For both single and married women, the viable health insurance options under different labor supply alternatives are treated as probabilistic. Thus, our first empirical model of considers the no work, part-time work, and full-time work decision of mothers given the predicted odds of various types of insurance offerings and various types of children's disabilities. Presumably, the tradeoff of time with children for market work to obtain health insurance coverage will depend upon the specific conditions of these children. Then, the weeks-worked decision of mothers is analyzed to determine if more transitory effects from children's health conditions appear.

To investigate how specific health conditions affect the ability to reallocate time optimally, the specific ICD9 codes attached to all children's physician visits and hospitalizations in these data were reviewed. A public health pediatrician, Dr. Jennifer Mayfield, developed indicators of

conditions that were either sufficiently severe or chronic to require substantial medical care expenses or the need for additional monitoring of children's health. They were then classified into a series of categories based on chronicity and disease state. Thus, this paper attempts to contribute to the literature on time allocation in two distinct ways: first, by analyzing insurance options; and secondly, by looking at specific child health effects on labor supply. The final section, 5, summarizes this research.

## **2. Summary of Women's Health and Economic Status in the US and Canada.**

**" . . . of the male from twenty years old unto 60 years,  
even thy estimation shall be 50 shekels of silver.  
And if it be a female, then thy estimation shall be  
thirty shekels." – Leviticus**

Remarkable similarities in female/male health status and service use appear across countries, regardless of their political orientation or degree of economic development. Similarly, the economic data reveal that limited earnings, and greater economic dependency are facts of life for women.

### **2.1 Health and Gender**

With regard to health care services, well-known gender differences exists: women live longer and use more health resources at most ages independent of childbearing. In developed countries, women see physicians more often, take more prescription drugs, and experience more disabilities than men. Women also engage in more health-preserving behaviors. By contrast, men drink, smoke, use recreation drugs, and drive fast. Men also tend to be disproportionately represented in occupations with high health risks, and accordingly suffer more occupational



injuries. (See, for example, Cleary et al., 1982; Coffey 1983; Marcus and Seigel, 1982; Sindelar, 1986; Verbrugge, 1985; Hunt-McCool et al., 1995.) Table 1 provides examples of these gender differences in health status.

These differences suggest that women are more expensive than men in terms of lifetime costs of medical care. The explanations of greater female use of services above and beyond use associated with longevity and reproductive health run the gamut. Socio-psychological literature describes use in terms of gender-specific propensities to seek medical care. Economic literature suggests that the relatively low cost of female time, or the "publicness" of medical advice for the entire household in conjunction with a traditional division of labor explain women's higher use of services. Finally, incidences of this and of course health-preserving behaviors are not generally equal for women and men.

## **2.2. Gender and Economic Status**

Differences in health status also exist in conjunction with education, wealth, and earnings. Persons in poverty die relatively early, suffer greater disabilities throughout their lives, and may also engage in greater risk-taking behaviors. Needless to say, poverty tends to be a female phenomenon. Two groups dominate poverty: sole female households and the elderly. (On poverty and health, see, for example, World Development Report, 1993.) Table 2 provides information on the status of women and female headed households in the US and Canada.

### **2.3 The Health Insurance systems in the US and Canada**

#### **2.3.1 Efficiencies of bundling goods and services**

*If the teacher happens to be a man of sense,  
It must be an unpleasant thing to him to be conscious  
while he is lecturing his students,  
That he is either speaking or reading nonsense--*

Economists teach us that goods are often bundled together to promote efficiencies: reduce search, take advantage of economies of scope, or reduce administrative costs. The apparent conflict between excessive spending on medical care by women are disproportionately low-income has been solved historically by bundling men and women together. In so doing, a household can take advantage of specialization and a division of labor that is both traditional and economically efficient. That is, women earn less so the value of their time is lower in the market. *De facto*, they devote cheaper hours the division of household labor; they specialize in caring for children and producing other goods and services for the family including health. In turn, women gain economically by sharing higher male earnings (in order to purchase market inputs for household production). Such assortative mating, the characteristics of which have been suggested in great degree are both economically efficient and welfare promoting. (i.e., Freiden, 1973.)

The second bundling that has occurred in the US but less so in Canada is the combination of health insurance and employment. As a result, time for children with special health problems and time in the market to obtain affordable medical care have been independent in Canada but not the US. Problems have arisen in the US as a result. High benefit cost firms in the US have caused to unbundle wages and health benefits. At the same time families also appear to be unbundling men and women. The US currently has 12 million families maintained by women only, and 4 million maintained by men only. Of a total 75 million families, of which half have children, the proportion of female-headed households is not inconsequential.

The results of being in households maintained solely by females in both the US and Canada is often poverty. In the US, another consequence is employees without health insurance coverage. Indeed, while more women in the US are covered by health insurance than men, this is the result of public coverage and private coverage and women spousal benefits. Privately, fewer women than men are offered health insurance on the job, and women are more likely to be covered

as a secondary beneficiary on the private policy of a household member than are men (Schur and Taylor, 1991).

### **23.2. Canada's Health Care System**

Canadian health policy is specified by the Canadian Health Act of 1984. The basic components of this act are: (1) all residents are enrolled; (2) all necessary health care is provided on a prepaid basis; and (3) administration is central and nonprofit. Financing is a joint federal/provincial arrangement. This act establishes the conditions that all provinces must satisfy in order to qualify for the full share of the federal transfer. The tenets of the health policy are explicit in the act: reasonable access unimpeded by financial barriers; comprehensive coverage of all necessary services; portability across provinces and across countries. Provinces are granted a great deal of latitude in use of these funds, provided they maintain the basic rules. For example, user fees and extra billing are allowed, but result in a dollar-for-dollar reduction in the federal transfer.

In 1994/5 fiscal year, provinces received a per capita federal health contribution of \$523.39. (Of this total, about 10% was used for extended care primarily by the elderly. This benefit included home care, nursing homes, residential care, and the like.) The full transfer is adjusted annually by the nominal growth in GDP. Because of the budget crisis, however, the adjustment formula has contained a larger and larger lag or discount in recent times, effectively reducing the per capita federal transfer. The financing formula varies, but is based on a transfer of 13.5 percentage points of the personal income tax and the corporate tax to all programs that support post-secondary education and health. The subsidy from the federal sector to the states is roughly split between the cash and the tax.

In theory, then, health care coverage is independent of the allocation of time.

Unfortunately this is only in theory. The federal transfer has declined in percentage terms and the inflation adjustment has been revised downward. While health care costs have risen steadily, earnings have grown relatively slowly over this period. The major component of growth in labor compensation is now in benefits, not earnings. Firms in Canada can and do offer supplemental health insurance to their workers that provide health benefits in addition to the basic federal benefits. As we have noted, some 60% of Canadians are covered by some form of supplemental insurance. Thus, the Canadian system looks more and more like the US system because of the budgeting problem.

### 2.3.3 The US Health Care System

By contrast the US health care system is a composite of producers, payers, and consumers in the private and public sector. Key features of the system are: near universal public insurance for the elderly (called Medicare from the federal government), and a more limited State/Federal Medicaid program for some poor, some poor children, and some elderly in need of long-term care. In this system profit and nonprofit entities compete for medical care dollars based on such criteria such as quality of care, market segmentation, teaching/service functions of institutions, affiliations or vertical integration with related service providers (e.g., affiliations of MD with laboratories.) Private coverage is voluntary, largely at the level of the employer. Regulation of providers ranges from self-regulation to *de facto* legal incentives associated with medical malpractice. Health Maintenance Organizations, hospitals that employ physicians, other health providers, insurance companies, consumer groups, legislators, and lobbyists effectively shape the content, composition, and probability of obtaining coverage. As a result the probability of obtaining coverage depends upon age, gender, personal wealth and income, geography, health status, expected health status, family health status, marital status, and the distribution of firms by



type and size in a geographic area.

The gatekeepers to affordable health care tend to be private insurance companies or HMO organizations that insure and deliver medical services. Most private insurance is purchased through groups, chiefly employers. Over 90% of all private coverage is employment-based and substantial cost differences exist between individual and group policy premiums.

Medicare is the federal program that covers most elderly and certain qualified younger disabled persons. Like private insurance, Medicare beneficiaries, the 34 million elderly and younger disabled population, must pay a deductible amount and a copayment for most services.

Unlike many private policies, prescription drugs are not covered by Medicare. Medicaid, by contrast, covers certain eligible low-income groups: the blind, disabled, aged, pregnant women and low-income families with children under six. Twenty-eight million persons received some Medicaid services in 1991. They were mostly poor or near-poor elderly and the very young. Medicaid is free and without user fees. Recently, the federal government mandated that Medicare cover all pregnancy and child-related care for children under six in households within 133% of the federal poverty level. As a result, in families with incomes below the federal poverty level, 63% of children up to age 5 were covered by Medicaid in 1990. This figure is roughly 20% of all US children.

Because Medicaid is of special interest for children with disabilities, some attention to this specific program is noteworthy. Federal mandated benefits include standard medical procedures (inpatient, outpatient, laboratory, physician services, family planning and supplies, skilled nursing care, and home health services for elderly). Depending on the state of residence, in-home services may be available for children. Medicaid is virtually the only source of care for children with disabilities in the home. Recent legislation expanded coverage to certain groups of low-income children (OBRA, 1989) to be incorporated by the year 2002. Just as in Canada, the states have substantial discretion over benefits, eligibility, and payments, making generalizations about

coverage and services difficult.

Among persons privately insured, the majority of US households, state regulations govern the behavior of private employers or unions who provide group-purchased insurances. To workers. States are specifically prohibited from regulating firms that self-insure. Thus, insurance coverage, for those persons in firms that offer insurance ranges from in vitro fertilization, to mental health, to hair transplants depending upon the state of residence (Gabel and Jensen, 1986).

In sum, the US system is loosely divided into Medicare for the elderly, Medicaid for some of the nations poor or elderly, and private employment-based insurance. The rules governing the allocation of private insurance are, however, changing as the cost of health insurance increases. Today, private firms are unbundling jobs and health benefits, or requiring workers to carry a larger burden of the direct expenditures on insurance. Full time employment, high wages, employment in large firms, preexisting condition exclusions, nonportability of insurance, and the like, support the attempt of firms to contain unit labor costs.

Currently, 13-14% of the US population have no health insurance coverage, either public or private. Three quarters of persons uninsured are in households with at least one employed member. Most of the uninsured are also above the poverty threshold. For workers, risk of insurance losses have increased. Only the highest wage workers increased their odds of being offered employment-based health insurance over the last 10 years, with all other groups falling. (Levitt and Ohlin, 1992).

### **3. Effects of Competing Demands on the Allocation of Time of Mothers**

We begin this discussion with stylized examples of "health production" in the US and Canada. Then a formal model in which health insurance and full time work are explicitly linked is developed, and the labor supply of women is described under this constraint.



### 3.1 Examples of Insurance Offerings and the Allocation of Time (Grossman 1972)

The basic model of health production is an application of the more general model of Becker's (1965) allocation of time. In the health production model, at least one of the home-produced goods is health stock of the family. Its inputs are time of family members and market-purchased medical care. Allowing substitution between time and goods (e.g., medical care), production isoquants can be developed which are associated with some indicators of health (e.g., absence of bed days per year, pain free days, life years). Like any other home production, the family is constrained by income (earnings and asset income), by time, and by the production technology. These constraints apply to health production and other home produced goods that generate household utility. Thus, health states are traded against other home-produced goods such as recreational time, dining, educating children, and other competing uses of money and time. Since money is generated mainly through labor supply, time in home production is purchased by reducing earnings when time is taken away from market work.

In Figure 1, the production isoquant and budget constraint that describe the case of independence of labor supply and access to health care. Figure 1 is effectively the theoretical Canadian model; the choices married women in the US face when her husband provides health insurance to the family; or the case faced by women whose earnings are too low to qualify for health insurance on the job at full time work. In this particular instance, the medical care needs and time needs can be satisfied without undue constraints on labor supply. They do not bind.

Figure 2 shows the effects of receiving health insurance on-the-job, effectively reducing the per unit price of medical inputs. Thus, the budget constraint rotates upward from T because medical inputs are cheaper, but nonmarket time in excess of 128 hours per week is no longer viable if insurance is accepted. The step in the budget constraint corresponds to the latter

constraint.

Figure 3 considers shows the budget constraint under Medicaid. A substantial penalty for market work exists in the form of the loss of eligibility for Medicaid (via the underlying income limits on ADC). The income transfer to mothers in poverty. The 100% tax on wage earnings appears very shortly for many women, given poverty-based eligibility rules. This is the flat segment of the budget constraint. Given minimum requirements of  $M$  and  $h$  denoted in the figure, work in the market is not viable. What the examples reveal, in sum, is that given major child health problems, certain mothers are faced with very limited choices, essentially Medicaid or marriage.

### 3.2 Background

Married women are expected to rearrange their work schedules more easily than single parents to accommodate the needs of children. Such adjustments in labor supply, especially decisions to withdraw from the labor market, are not costless, however. For example, Bane and Ellwood (1989) cite the importance of households with two working parents in stemming the growth of poverty among two-parent families. Cunningham and Monheit (1990) also show that private health insurance coverage of children is strongly associated with the presence of two working parents. By contrast, single mothers are at a particular disadvantage in caring for a sick child since they often have sole responsibility for providing income as well as child care. Consequently, they may be unable to adjust their labor supply to the same extent as married women when child health problems arise.

In both married and single households, maternal time in the production of child health competes with labor market activity and therefore, with the ability to pay for medical care directly through wage earnings or indirectly through employment-related health insurance. In general, employment-related coverage is less expensive than its private market counterpart. In households

with unhealthy children, maternal labor supply is ultimately determined by the necessity to substitute time in child care for market work and by the competing pull into the labor market from wage income and employment-related insurance. The distinction between the US and Canada, therefore, has consequences for children's health, for the types of child care arrangements that may be required, for women's careers, their human capital development, and economic dependency.

Salkever (1980, 1982a, 1982b), Breslau, Salkever, and Staruch (1982), and Breslau (1983) have examined how disabled and chronically-ill children affect maternal time allocation. Salkever found that children with disabling health conditions affected maternal labor supply primarily through reduced annual hours of work, but that child health had only a small impact on participation decisions. He defined conditions through indicators such as mobility and sensory limitations, mental and nervous system disorders, heart, and circulatory or respiratory ailments, and observed significant effects on maternal labor supply in white, two-parent families. The availability of job-related health insurance, as well as eligibility for public medical care, was not explicitly considered in Salkever's empirical work although he acknowledged their importance. Breslau, Salkever, and Staruch reported that the presence of a disabled child reduced labor supply of married women but had little effect on single mothers. Examining nonmarket time allocation Breslau found that the presence of a disabled child (i.e., children with cystic fibrosis, cerebral palsy, myelodysplasia, or severe physical handicaps) increased the time a married mother spent in housework by more than three hours per week but had no discernable effect on time use by single mothers. A common theme that has emerged in these studies is the greater responsiveness of married women's labor supply to child health problems compared to that of single mothers.

### 3.3 A Formal Model of Time Allocation

Our model of parental time allocation in the presence of children with health problems draws upon the household production framework formalized by Becker (1965) and applied to the production of health by Grossman (1972). This framework is extended to incorporate the availability of work-related health insurance and the required tradeoff between fringe benefits and wages in competitive labor markets.

#### 3.3.1 The Maximization Problem Facing The Single Parent

We begin with the simplest case of one parent and one child with health capital  $H_0$ . Parental utility is defined as  $U(X, H)$  where  $X$  is a good purchased exclusively in the market and  $H$  is child health, a commodity produced with inputs of parental time and medical care. The child health production function is:

$$(1) H = H[M, l_h | H_0, r(e)]$$

where the productivity of inputs  $M$  (market-based health services) and  $l_h$  (parental time in child health) is contingent on the initial stock of health,  $H_0$ , and the rate of depreciation of health capital,  $r(e)$ . Depreciation is unknown but is presumed to follow a known probability distribution defined by  $e_i$  ( $i = 1, 2$ ). In good health (state 1), which occurs with probability  $p_1$ , depreciation  $r_1$  is low, while a poor health state (state 2), characterized by probability  $(1 - p_1)$ , depreciation is  $r_2$  ( $r_2 > r_1$ ). The marginal productivity of  $M$  and  $l_h$  are presumed greater in the poor-health state, and hence there is a state specific utility created by the inputs time, market goods, and medical care.

If the family has health insurance covering the child, the price of medical care,  $P_m$ , is not constant. Instead, out-of-pocket medical care expenditures for the family are:

$$(2) D + \zeta (P_m M_2 - D)$$

assuming the poor health state occurs where spending on  $M$  exceeds the deductible,  $D$ . Additional



out-of-pocket spending beyond  $D$  is determined by  $\zeta$ , the coinsurance rate so that the family spends only  $\zeta M$  per unit of  $M$ . In the healthy state defined by  $r_1$ , spending is not expected to exceed the deductible, and is simply  $P_m M_1$ .

Private insurance obtained through employment is not free to the household. If employers are competitive, no single employer can afford to offer compensation greater than the market rate. Firms can, however, differ in the availability and level of benefits for a constant level of total labor compensation (See Erenburg, 1983). Thus total compensation to a worker of  $\$S$  per hour must be divided between wages per hour and benefits per hour. If a worker accepts health insurance as part of total compensation, hourly compensation becomes:

$$(3) S = w + P_i I$$

where  $P_i I$  is the value of insurance purchased per hour of work by an equivalent reduction in hourly wages.

The process which determines labor supply versus time in home production can be described by maximizing expected utility:

$$(4) \max E U(X, H) = p_1 U(X^1, H^1) + (1 - p_1) U(X^2, H^2)$$

subject to a time constraint which divides total hours between home production and market labor:

$$(5) T = I_n + I_m$$

an hourly compensation constraint as in (3) above, and the child health production function described by (1). Out-of-pocket spending on medical care is dependent upon the state-specific health outcomes. The cost of health care to the family is termed  $G(M, I)$ , and its expected value is the sum of spending in each state weighted by state-specific probabilities:

$$(6) E G(M, I | \zeta, D, P_m M) = p P_m M + ((1 - p) [D + \zeta (P_m M - D)])$$

Total income of the household is made up of unearned income,  $V$ , and total wage income,  $w I_m$ . Since purchases of market goods,  $X$ , and spending on medical care cannot exceed total income,

the budget constraint is defined by equating actual spending with actual income in each state as:

$$(7) \quad X + G(M, I) = V + w l_m = V + w (T - l_h)$$

or simply as:

$$(8) \quad X = V + (S - P_1 I) (T - l_h) - G(M, I)$$

where,  $X$ ,  $l_h$ , and  $G$  are specific to the state of health that actually occurs.

The problem can be restated:

$$\begin{aligned} (9) \quad \max EU\{V + (S - P_1 I) (T - l_h) - G(M, I), H(l_h, M)\} \\ = p U\{V + (S - P_1 I) (T - l_h^1) - P_m M, H_1\} + (1 - p) U\{V + S - P_1 I) (T - l_h^2) \\ - [D + \zeta(P_m M - D)], H_2\} \end{aligned}$$

The first order conditions are

$$(10a) \quad E(U)_I = -p U_x(P_1(T - l_h^1)) - (1 - p) U_x\{P_1(T - l_h^2) + G_1\} = 0$$

$$(10b) \quad E(U)_{l_h} = -p U_x(S - P_1 I) - U_h H(l_h^1) - (1 - p) U_x\{S - P_1 I - U_h H_m^2\} = 0$$

$$(10c) \quad E(U)_M = -p\{U_x G_m^1 - U_h H_m^1\} - (1 - p)\{U_x G_m^2 - U_h H_m^2\} = 0$$

Equation (10a) can be transformed into the familiar conditions for optimal insurance: an individual will transfer consumption of  $X$  between states of child health (through the purchase of insurance) in proportion to the odds of poor health state occurring. Notice that as  $p$  increases,  $G_1$  approaches zero and there are no cost-savings from insurance. Similarly, if  $p$  is low, the benefits from insurance are great, and individuals should be willing to trade wages and hence consumption in state 1 for this benefit. The equilibrium levels of  $l_h$  and  $M$  are described in the remaining conditions so that the exchange between market goods and child health and medical care and child health is optimal given the probabilities of each health state.

The first order conditions can be differentiated to develop for  $I$ ,  $l_h$ , and  $M$ , defined as functions of exogenous prices, income, and the variables in the utility and production functions. Maternal labor supply is obtained by solving the demand for time in home production. It too is



state-specific and depends upon the state of health of the child which occurs. Maternal labor supply  $l_m$  can be expressed as:

$$(11) \quad l_m = T - l_n = l_m(w, P, I, P_m, V, D, \xi, H_0, r(e)).$$

### 3.3.2 Constraints On Insurance Provision

In reality, time constraints can preclude market work entirely, or limits on work hours or earnings may preclude the offer of health insurance. A likely constraint facing female heads of households is that their wages may be too low for the firm to offer any health insurance (given its indivisible nature). For example, health insurance is unlikely to be offered to part-time or to minimum or low wage employees whose wages cannot be reduced to offset the costs of insurance. For persons affected by these constraints,  $P_I = 0$  and  $w = \$S$  regardless of preferences.

Since full-time employment is usually a requirement for work-related coverage, the utility of employer-sponsored insurance depends upon the degree to which parental time in child health can be substituted for market-provided health care and the extent to which substitutes exist for private health insurance. Women with low earnings are unlikely to be offered health insurance. An alternative source of health care provision for low-income women and children is Medicaid. Eligibility requirements vary by state but are generally means-tested.

Both the availability employer-sponsored health insurance and Medicaid eligibility are unknown *a priori*. Even full-time work may not guarantee that a worker will obtain employee-related coverage. Firm attributes including the average preferences, size of the existing work pool, and the ability to achieve group-purchase discounts will affect the availability of insurance. Similarly, a complex system of regulations by states and the Federal government determines Medicaid eligibility. Accordingly, the decision to participate in the labor market is conditioned on the likelihood of obtaining work-related or public insurance coverage. Such probabilities are explicitly

included in our empirical specifications of maternal labor supply.

## 4. EMPIRICAL TESTS

### 4.1. Data

To empirically examine the relationship between maternal labor supply and child health, and to assess the impact of private and public health insurance, we employ data from the 1987 National Medical Expenditure Survey (NMES). NMES is a year-long survey of the medical care use and expenditures, health insurance coverage, and employment experience of the United States population covering approximately 15,000 households. This analysis employs a subset of families with children between 1 and 17 years of age. These data consist of 3,089 two-parent families and 1,590 single parent families in which the mother is present. The sample of married mothers is further restricted to households in which husbands are employed as full time wage and salary workers. In this way we avoid complications created by the diversity of employment experiences among spouses. While we acknowledge the joint dependency through the labor supply/insurance choices of the spouses as a practical matter data do not allow us to incorporate these complexities. We have excluded children less than one year of age from our analysis in order to separate the usual time-intensive demands on parents associated with the care of infants from the effects of children's health.

Child Health in NMES is obtained from two sources of information. First, the symptom, reason, or condition associated with any reported medical event (e.g., physician office visit, hospitalization, use of outpatient clinic) or disability day was coded into a specific disease category according to diagnostic classes established by the International Classification of Diseases 9th edition. Next, this information was supplemented with data based on parental responses to the NMES Health Questionnaire for children 4 years of age or younger and for children 5 to 17 years

of age. Parents were asked about the general health status of their children, the presence of activity limitations, and the presence of acute and chronic health problems. We included indicators of activity limitations (whether the child was limited in any way in any activity because of an impairment) and of specific chronic conditions present during the past year, such as asthma, heart murmurs, and other heart problems, and constant and long-lasting digestive problems.

Criteria for defining child health problems include not only physical disabilities but illnesses of a chronic, persistent or recurrent nature. Specifically, we used three decision rules for classifying a child as having a health problem: (1) the condition or diagnoses is potentially costly in terms of parental time or medical care costs; (2) the condition is associated with the risk of unanticipated child care demands that can interrupt routine schedules such as schooling or work; (3) that the presence of the condition is likely to be independent of the time at which it was reported. (The last criteria is not included in analyses of short run effects child health on annual weeks worked).

The following broad classes of child health problems were extracted: (1) sensory and ambulatory limitations [LIMITATIONS], (2) acute and chronic infectious diseases [INFECT], (3) allergies and asthma [ALLERGY], (4) psychological disorders including drug dependency, emotional problems, depression and eating disorders [PSYCH], (5) head trauma, fractures affecting mobility, and severe burns [TRAUMA], (6) metabolic and digestive tract problems [METADIG], and (7) pulmonary and cardiovascular system problems [PULMONARY CARDIAC]. Infectious diseases and allergies, which are common among children, were included in the analysis when they were associated with unusual events such as the loss of ten or more days from school or an episode of hospitalization and denoted INF\*BED and ALL\*STAY, respectively.

Table 3 provides a description of the distribution of children aged 1-17 in the 1987 NMES sample according to specific health conditions. Most of the children with conditions are found to



have acute or chronic infectious diseases or allergies and asthma, which were included to assess the impact of health problems of a recurrent or episodic nature, and do not, in and of themselves, connote severity. Between 2 and 3 of percent children in our sample have relatively serious health problems of a physically or mentally disabling nature as well as problems which may have required a period of hospitalization.

#### 4.2. Model Specification

To estimate the effects of child health and the availability of private and public insurance upon maternal labor supply, we first specify multinomial logit models describing the choice of usual hours of work by single and married mothers. These equations are used to examine the impact of child health on the long run equilibrium decision to work: at full-time or part-time hours or not at all. These equations are illustrative rather than definitive because we do not employ joint MLE for the endogenous participation/insurance decisions. Still, they provide some insights that may be tested more rigorously about the participation/insurance nexus. They also provide additional information about specific childhood diseases and conditions, and the employment responses of their mothers. As a second-level test of the child health/maternal labor supply relationships, we estimate weeks worked for employed mothers. Transitory labor market responses to child health problems may be suggested by this analysis. To do so, we apply Heckman's (1979) two-stage procedure to predict whether married and single mothers work and then to estimate the determinants of annual weeks worked adjusting for any sample selection effects. Our measure of annual weeks worked includes vacation time. Hence, we hypothesize that once adjustments are made for human capital endowments and labor market conditions, we will observe any irregular or short run responses to acute episodes of poor health via a reduction in weeks. Each of these equations was specified to include the child health conditions described

previously and a series of human capital and demographic characteristics of single and married mothers. In addition, our labor supply models adjust for any structural labor supply differences associated with race by including interactions with BLACK (the interaction terms are denoted by the letter B preceding the usual variable name). Variables included in the empirical models are described in Table 4.

Distinctions between empirical models of usual hours and annual weeks worked are as follows: in the hours decision, for both single and married mothers the decision to work and the decision regarding weekly hours of work is specified as a trichotomous choice process. Choices include the decision not to work, to work at part-time hours (less than 35 per week) or to work full-time (the omitted group). We formally test for IIA following Hausman and McFadden (1984). To be discussed, in tests for both single and married mothers, we cannot reject the null hypothesis of independence among choices.<sup>1</sup> Both of the sets of estimates for single and married women include continuous variables denoting (AGE), highest year of schooling completed (EDUC), the number of young children in the household (children 2 years of age and younger, CHILDREN1-2, children between 3 and 5 years of age, CHILDREN3-5), and unearned family income (NONEARNED INCOME). The availability work-related health insurance is captured by the variable PROB.INSURANCE, the estimated probability of receiving health benefits should the

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<sup>1</sup>The Hausman-McFadden test involves a comparison between coefficients of a full-choice model inclusive of all alternatives and the coefficients of model restricted to a subset of alternatives. Intuitively, for IIA to hold, the addition of an alternative should not alter parameter estimates of the remaining choices. The Hausman-McFadden test statistic is defined as  $(\beta_R - \beta_U)' [\text{Cov}(\beta_R - \text{Cov}(\beta_U))]^{-1} (\beta_R - \beta_U)$  and has a chi-square distribution with R degrees of freedom (the number of elements in the subvector of coefficients from the restricted choice model). For discussions of the IIA property and the Hausmann-McFadden test see Hausman and McFadden (1984), Greene (1990), and Mitchell and Fields (1984) and Ben-Akiva and Lerman (1985).

mother choose to work full time.<sup>2</sup>

Specifications for single and married women include the following distinctions. Since Medicaid may be a viable health insurance alternative for single women, we included the variable PROB.MEDICAID to capture the probability that a single mother would be eligible for Medicaid. Our specification for married women is restricted to those women whose husbands are employed. Medicaid eligibility is generally limited under these circumstances. We do include the variable FATHER INSURED to indicate whether or not the working husband is a policy holder of an employment-related plan. Equations for both single and married women include the variable PROB.INSURANCE, the probability of obtaining employment-related insurance at full-time work. The estimating equation of the labor supply of married women also controls for hourly market earnings of the husband (FATHER'S WAGE) and for NONEARNED INCOME. The latter is excluded from the multinomial specification for single women because almost all nonworking single mothers had missing or zero values for this variable.

In the regression of annual weeks worked, a two stage approach is employed. In the first stage, binary probit equations describing the likelihood of mother's employment were estimated.

The inverse of Mill's ratio was derived from the probit equations and used to correct for selectively bias in second-stage estimates of annual weeks worked. Variables denoting the availability of private and public health insurance were included in the probit equations but not in the weeks equation. Variations in weeks are expected to reflect more transitory labor supply responses while the pull of insurance is expected affect decisions to seek employment.

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<sup>2</sup>Binary probit was used to estimate the likelihood that single and married mothers would obtain employment-related insurance. These equations were estimated for a sample of mothers employed full time and predicted values assigned to all mothers in our sample. The probability of Medicaid eligibility was also estimated via binary probit for single, nonworking mothers and predicted values assigned to all single mothers.



The specification of weeks worked differs from the multinomial logit specification of hours per week in certain other regards. The hourly wage of the mother is included in the weeks equation alone, since it is observed only for working women. Additional variables include PROFMGR, a dichotomous variable set equal to 1 if the mother is employed in a professional or managerial capacity (0 otherwise), and dichotomous variables SALES, MANUF (manufacturing), SVCS (service sector other than entertainment and personal services) indicating industry of employment. A set of regional dummy variables NCENT, SOUTH and WEST were also included. These variables serve as controls for cyclical employment due to differences in occupational and industry-specific turnover rates and regional differences in labor market conditions. In this way, we control for factors giving rise to unemployment, and expect that the observed variations in weeks associated with children's health measures are indicative of the temporary effects of episodes of illness.

## 5. RESULTS

Multinomial logit estimates<sup>3</sup> of employment decisions by single and married women are found in Table 5 and 6 respectively. Ordinary least squares regressions for annual weeks worked (adjusted for selectivity bias) for single and married women appear in Table 7. In general, our results indicate that potentially chronic illnesses in children deter both single and married mothers from full-time or part-time employment. In the presence of chronic child health problems, those women who choose to work are likely to work part time. Health conditions that may be regarded

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<sup>3</sup>The assumption of Independence of Irrelevant Alternatives was examined in the specification for single and married mothers via the Hausman-McFadden test described above. In both specifications, we could not reject the hypothesis of independence. The Chi-Square statistic for single mothers was 6.29 with 16 degrees of freedom, while that for married mothers was 10.87 with 20 degrees of freedom.

as less chronic or more episodic in nature (such as traumatic injuries associated with fractures and burns or mental health problems) have a transitory effect on the labor supply of married mothers through a reduction in annual weeks worked. In contrast, single mothers reduce annual weeks in response to chronic health problems. The difference in response to each type of health problems makes intuitive sense. Child care responsibilities associated with chronic illnesses are more likely to preclude labor force participation by both single and married mothers. Once employment has been obtained, however, it appears that married mothers have more latitude than single mothers to substitute time in child health for market time. Consequently, more transitory health problems lead to short-run variability the labor supply of married women.

Table 5 contains coefficients and marginal probabilities from the logit model of hours of work for single mothers.<sup>4</sup> Our results indicate that having a child with activity limitations (LIMITATION) increases the probability of no work relative to full-time work by 9 percent, and increases the probability of part-time to full-time work by 4 percent. Children with pulmonary or cardiovascular health problems also deter single mothers from full time work, increasing the probability of no work relative to full-time employment by 7 percent and raising the likelihood of part-time relative to full-time employment by 6 percent.

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<sup>4</sup>Marginal probabilities are computed as follows: let  $P_1$  and  $P_2$  denote the predicted probabilities of no work relative to full time work and of part time work relative to full time work, respectively. Normalizing on full-time work, the multinomial logit equations for these predicting probabilities are:

$$P_i = e^{x_i\beta_i} / (1 + \sum e^{x_i\beta_i}) \quad i = 1,2$$

where  $\beta_i$  are the coefficients obtained from estimation. These coefficients are converted to partial derivatives as follows:

$$\delta P_1 / \delta X_i = P_1\beta_i - P_1 [ P_1\beta_1 + P_2\beta_2 ] ; \quad \delta P_2 / \delta X_i = P_2\beta_2 - P_2 [ P_1\beta_1 + P_2\beta_2 ] .$$

As the probability of Medicaid eligibility at zero hours of work increases, single mothers are more likely to work part-time relative to full-time employment. These effects, while statistically significant, are small. Each ten percentage point increase in eligibility results in an increase in the likelihood of no employment by 0.7 percentage points and part-time employment by 0.3 percentage points. Finally, although only marginally significant at the ten percent level, a ten percentage point increase in the probability of employment-related health insurance yields a 2 percentage point decrease in part-time relative to full-time employment.

Chronic child health problems also affect employment decisions of married mothers (Table 6). These mothers are more likely not to work relative to full-time work by 8.1 percent and 13.3 percent, respectively. In contrast to single mothers, infectious illnesses associated with a large number of school days lost (INF\*BED) affect employment decisions of married mothers, increasing the probability of no work relative to full-time employment by 9.7 percent.

Married women are drawn to full-time work relative to no work as the probability of an employer-provided insurance offer (PROB.INSURANCE) increases. The effect is computed to be a five percentage points reduction in the likelihood of no work relative to full-time employment for each ten percentage point increase in the probability of an insurance offer. Since this labor supply specification contains human capital and other characteristics which affect earnings (such as education, race and number of young children), we are fairly confident that this finding is not a proxy for the correlation between unobserved high wages and the probability of an insurance offer. We also observe that if a husband is a policyholder of employment-related health insurance, married women are more likely not to work or to work part-time relative to full-time employment. The former probability is increased by 9.3 percent, while the latter increases by only 1 percent.

Some familiar labor supply effects related to economic and demographic variables appear in Tables 5 and 6. In particular, education reduces nonparticipation relative to full-time hours of



work for both single and married women, and this effect is reinforced for black married women. Young children in both age classes increase nonemployment relative to full-time work for single women (Table 5) and for married women (Table 6), but the effect of very young children on nonemployment is reduced for black single women and for black married women with children between 3 and 5 years of age. Black single mothers are more likely than whites not to work relative to full-time employment, although this effect is reduced as education and the number of young children increase. Finally, income effects influence married women's labor supply. Increase in unearned income and in husband's wages raise the probability that married women will not work relative to full-time employment (Table 6). Note that increases in husband's wages may also reinforce nonparticipation through a substitution of maternal time for husband's time in the production of child health.

Table 7 provides regression estimates of annual weeks worked (adjusted for selectivity bias) for single and married women. In contrast to their effects on usual hours of work, more acute and episodic child health conditions appear to have short-run effects on the labor supply married women. Married women whose children have sustained a traumatic injury (TRAUMA) reduce annual weeks worked by 4 weeks, while those having children with mental health problems (PSYCH) reduce annual weeks by over three weeks. In contrast, single mother reduce annual weeks worked only in response child health problems associated with chronic illnesses such as PULMCAR and infectious diseases associated with 10 or more school days lost (INF\*BED). The former health condition yields a reduction in annual weeks worked by over 4 weeks while the latter condition results in a 9 week decline in annual weeks worked.

## 5. Summary and Conclusions

The artifact of combining employment and health insurance in the US and more recently,

in Canada has certain deleterious consequences, especially for women's employment. Job lock has been found by Stone, (1994), Monheit and Vistness, (1995), and Madrian, (1994). Similarly, Moffitt and Wolfe (1990) have found a relationship between health care needs, employment-based insurance, and Medicaid. They found that women would reduce their Medicaid attachment by 6 percent (increase their work force attachment by 12 percent), if 1/3 more jobs offered health insurance. Wolfe and Hill (1992) have also simulated the effects of mandated benefits under different health states and varying hours of work. Health insurance appears to create a stronger effect on work than childcare or wages if either women or their dependents are in poor health.

We have studied a related phenomenon--the rigidity in the work schedule created when essential benefits are tied to the job. We illustrated our concerns using data on US women who are the mothers of children with health disabilities. As expected, single mothers have fewer degrees of freedom than their married counterparts. Similarly, US women have fewer degrees of freedom than their Canadian counterparts, at least for now.

There are many reasons why health insurance tied to jobs is inefficient or inequitable. It is also difficult to monitor, and may invade the privacy of workers. Further, the zero-sum alternative of Medicaid, available primarily to low-income single parents, has its own set of disadvantages. For example, lifetime income and wealth must remain low to maintain health care coverage, and marketable skills will depreciate over time with Medicaid limitations on work. Recent health care reform proposals have been tied to expanding employer-mandated coverage. The rationale is budgetary, because expansion of the existing system is much less costly in the short run than creation of a new national-level trust fund. Such expansion does not solve the fundamental problem created by children with special needs for time. Women would appear to suffer more than men from expansion of employment-based insurance, because of health needs, economic status, and their major roles in nonmarket production of health. This will be true in the US and Canada.

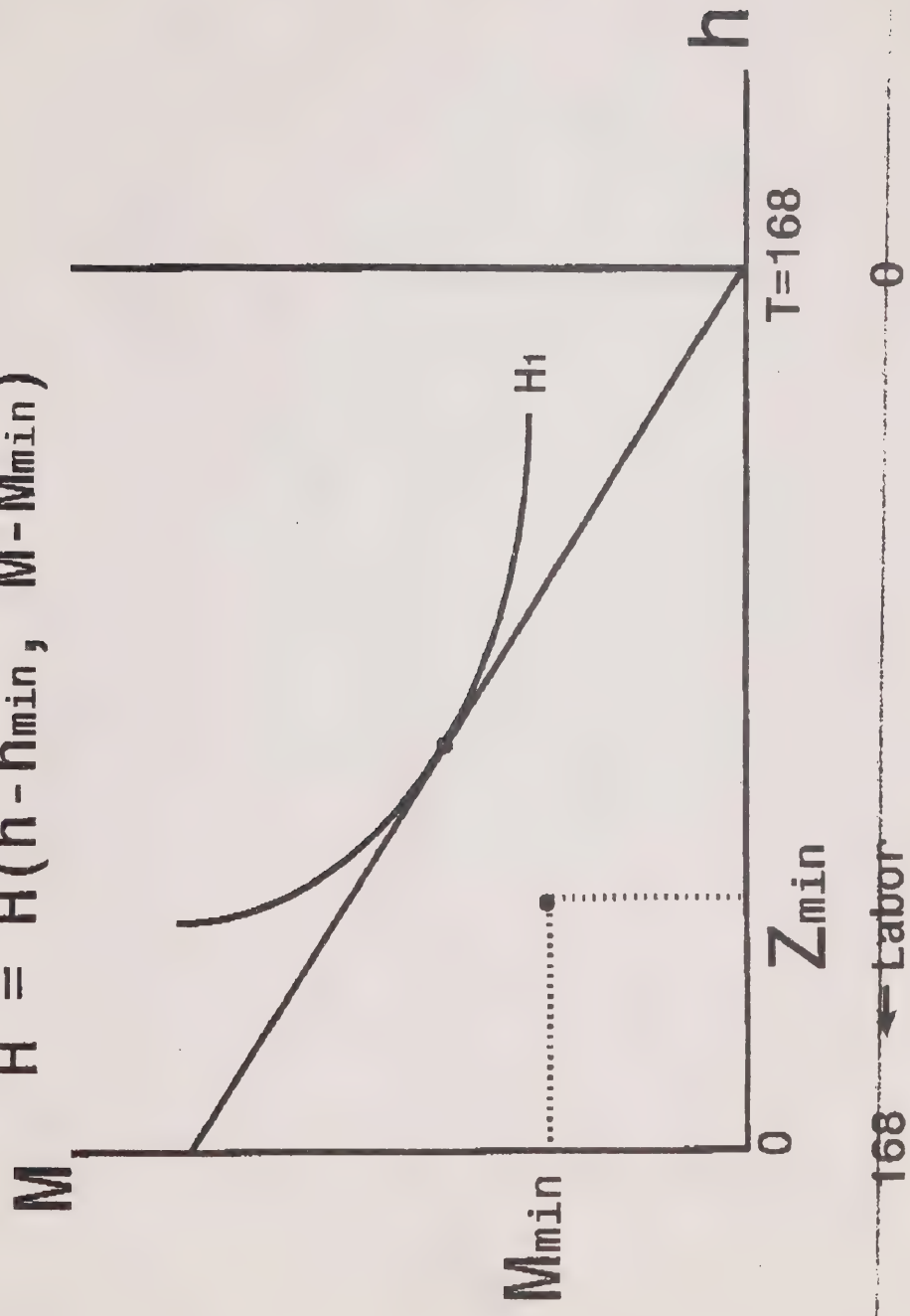


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Figure 1  
 $H = H(h - h_{\min}, M - M_{\min})$



# Figure 2

I if  $l \geq 40$

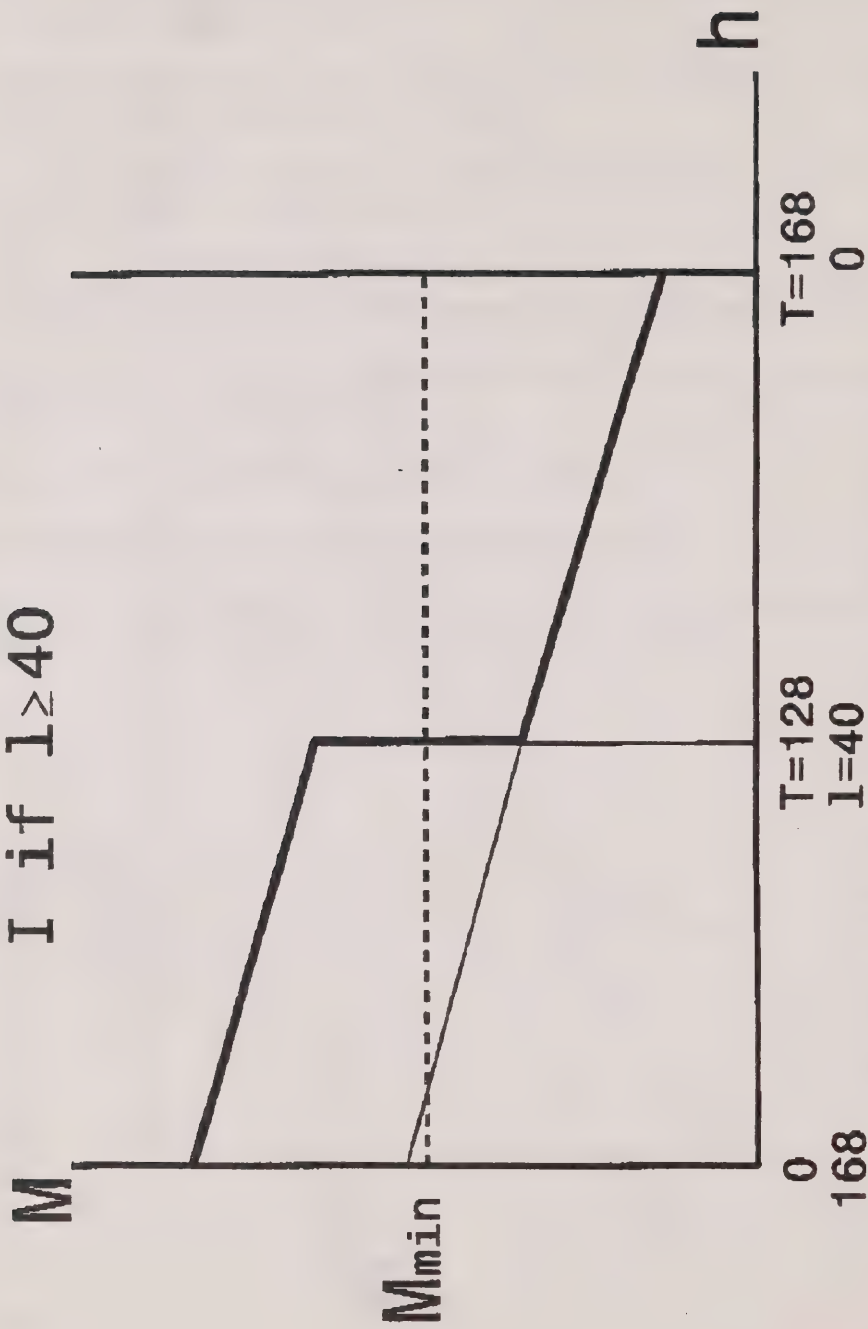
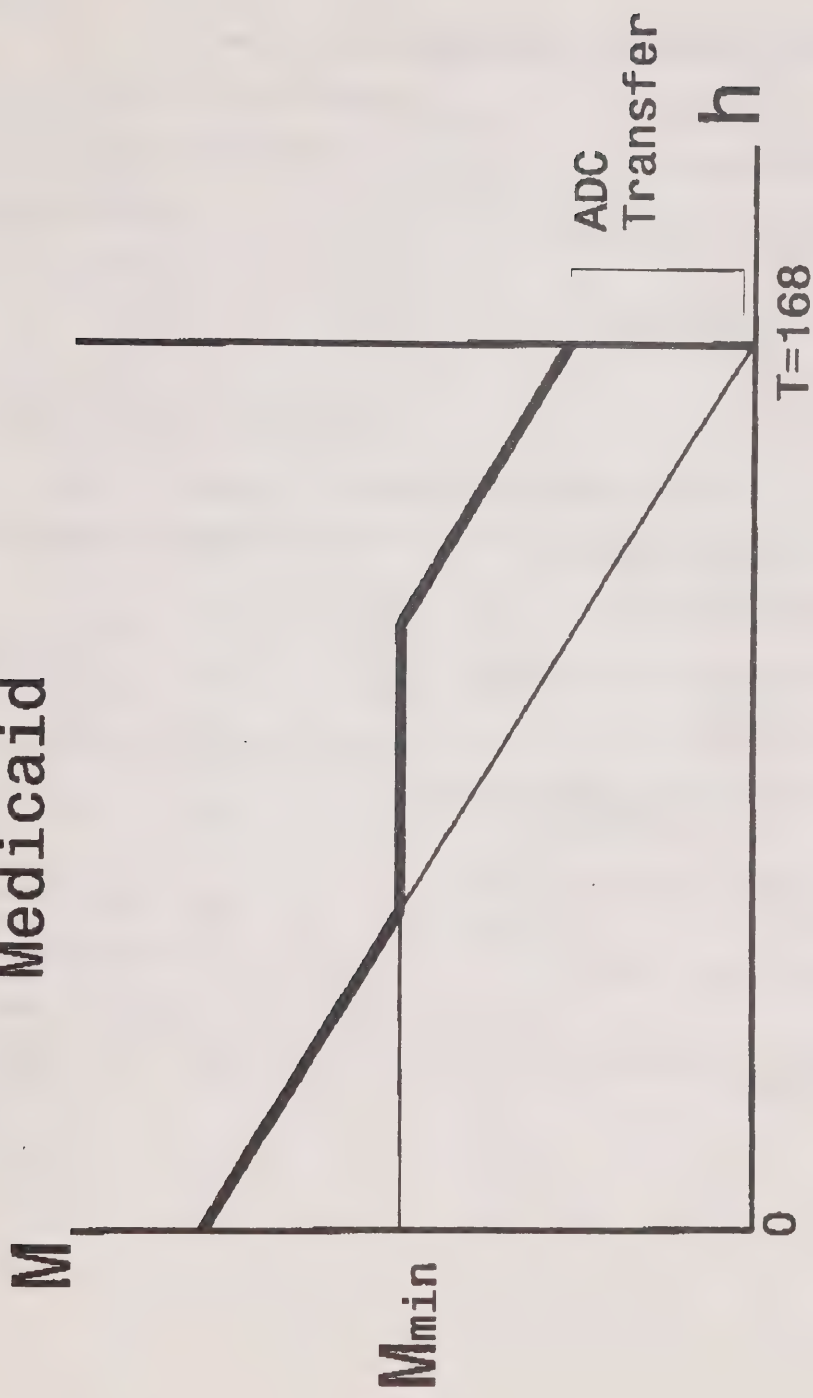


Figure 3

Medicaid





**Table 1. Comparative Health Statistics: Women and Men**

<b>1. Financing</b>	<b>Canada</b>	<b>US</b>
%GDP (1989)	6	13
ATR (1993) on average income	30-32	32 (Fed, Medi., SS)
<b>2. Life Expectancy:</b>	<b>Women</b>	<b>Men</b>
US	77	71
Canada	78	71
<b>3. Disability, Disease, and Utilization:</b>	<b>Women</b>	<b>Men</b>
US (Activity Limitations )	14.2%	13.2
Canada disabled	16	
US Cancer rate (age-adjusted)	5.5	4.0
US Arthritis	23	17
US work days lost per 100 emp with acute condition	353	277
US work related acc./dis. days per 100 person w/acc.	240	280
US Doctor visits/year	6.2	4.5

Sources: AHCPR, 1987; Statistics Canada; WHO 1992; Vital and Health Statistics, 1999; WDR, 1993; Revenue Canada

**Table 2. The Economic Status of Women in the US and Canada**

**1. Poverty**

	<b>US (91-92)</b>	<b>Canada (1991)</b>
total	<b>14-15</b>	<b>16%</b>
households headed solely by females		<b>61.9%</b>
children <6, (6-17)	<b>25 (22)</b>	<b>18.3</b>
minorities, aborigines, or migrants		<b>28-33% (females)</b>
Blacks (Hispanics)	<b>33 (30)</b>	
elderly	<b>12.2</b>	

**2. Labor Force Participation and Employment**

	<b>US</b>	<b>Canada</b>
% LF		<b>48</b>
Female LFPR		<b>76</b>
ER mothers (wives) with child.	<b>63</b>	<b>(71)</b>
ER mothers(wives) w/ child <6	<b>55</b>	<b>(60)</b>

**3. Female/ Male earnings (median weekly in USD; average annual in \$C)**

	<b>Female</b>	<b>Male</b>	<b>F as a Percent of M</b>
Full-time US 1996.1	<b>419</b>	<b>557</b>	<b>75</b>
Canada FT 1994	<b>29300</b>	<b>39000</b>	<b>72</b>
Canada all employed	<b>16500</b>	<b>28600</b>	<b>60.</b>

**4. Wage and Salary Earnings by household status, US 1993**

<b>Household Type</b>	<b>Median Weekly Earnings</b>
1 earner	<b>\$418</b>
2+ earners	<b>\$943</b>
maintained by men only	<b>\$534</b>
dual earners	<b>\$982</b>
Hisp and Black households	<b>\$500</b>

**5. F earnings/M earnings ratio (FT workers, 1996.1 US)**

Prof, admin	<b>72</b>
Tech, sales, cler	<b>67</b>
Services	<b>57</b>
Craft, prec. Prod	<b>67</b>
Operatives, labor	<b>75</b>
Farming	<b>67</b>

**Table 2. Continued**

**6. Health Insurance Coverage**

<b>CANADA</b>		<b>US</b>	
<b>Total public</b>	<b>100%</b>	<b>Total</b>	<b>86%</b>
<b>private supp</b>	<b>60%</b>	<b>private only</b>	<b>62%</b>
		<b>Employed w/ priv.ins</b>	<b>75%</b>
		<b>Elderly federal</b>	<b>98</b>
		<b>Poor children &lt; 6</b>	
		<b>Medicaid</b>	<b>60</b>
		<b>Private</b>	<b>20</b>

Sources: Statistics Canada: US BLS: US NHIS: SIPP: US Commerce Department: US Health Care Financing Administration

Table 3

## Distribution of Children by Health Conditions in the Sample

	Percent
Sample	100.0
Health Problems	66.9
Limitations	3.0
Allergy and Asthma	13.0
Infectious Diseases	15.4
Trauma	2.9
Pulmonary and Cardiovascular	3.3
Metabolic and Digestive	2.5
Psychological	2.3
n	8945

Sum of percents exceed 100 percent since children can have more than one health condition.

Source: 1987 National Medical Expenditure Survey, Agency for Health Care Policy and Research. (These statistics are no representative of US children).

Table 4

## Variable Symbols and Definitions

<b>Labor Supply</b>	
EMPLOYED	Dichotomous indicator equal to one if the mother worked outside the home
<b>Hours</b>	
NO WORK	Trichotomous variable denoting mother does not usually work in the labor market
PARTTIME	Mother usually works between 15 and 34 hours per week
FULLTIME	Mother works a usual week of 35 or more hours
WEEKS	Annual weeks worked outside the home in 1987
<b>Health Status of Children (Condititons)</b>	
LIMITATIONS	Parents report sensory and ambulatory limitations
PULMONARY CARDIAC	Presence of child with pulmonary or cardiac disorder
METABOLIC DIGESTIVE	Presence of child with metabolic, digestive or endocrinal disorder
PSYCH	Psychological or mental disorder
TRAUMA	Head trauma, fracture or break affecting walking, or serious burns
INFECT	Presence of acute or chronic infectious disease
ALLERGY	Allergy or asthma
<b>Health Status of Children (Events)</b>	
BED10	Child has lost 10 or more school days due to a health condition
STAY	Child had at least one episode of hospitalization
<b>Health Conditions (Interactions)</b>	
ALL*STAY	ALLERGY = 1 and one or more hospitalizations
INF*BED	INFECT = 1 and BED10 = 1



**Table 4**  
**Variable Symbols and Definitions**

<b>Insurance Probabilities (Probabilities Predicted by Probit Equations)</b>	
PROB. MEDICAID	Probability that a mother would be eligible for Medicaid if she did not work outside the home
PROB. INSURANCE	Probability that a mother would be offered medical insurance from employment if she were to work fulltime
<b>Other Health Insurance</b>	
FATHER INSURED	Dichotomous variable equal to one if the husband holds employment-related insurance in 1987
<b>Personal Characteristics</b>	
AGE	Age of mother
EDUC	Years of schooling completed by mother
GRADE 6	Dichotomous variable equal to one if mother has completed the sixth grade only
GRADE 9	Equals 1 if mother completed ninth grade only
GRADE 12	Equals 1 if mother completed high school
GRADE 8	Equals 1 if mother has completed grades 6,7 or 8
GRADE 11	Equals 1 if mother has completed grades 9,10 or 11
BLACK	Equals 1 if race of mother is Black
CHILDREN0-2	Number of children 2 years or younger
CHILDREN3-5	Number of children between 3 and 5 years
PROFMGR	Equals 1 if mother's occupation is professional or managerial
SALES	Equals 1 if mother's occupation is sales
SVCS	Industry of employment is services other than personal household services
MANUF	Industry of employment is manufacturing

Table 4

## Variable Symbols and Definitions

<b>Income and Wages</b>	
NONEARNED INCOME	Income form all sources except work and transfer payments
MOTHER'S WAGE	Hourly earnings of mother
FATHER'S WAGE	Hourly earnings of father
<b>Area Characteristics</b>	
WEST	Census region is West
NCENT	Census region is North Central
SOUTH	Census region is South
UNEMPLOY	Country unemployment rate

Interactions: determinants of labor supply are interacted with BLACK and denoted by BAGE, BINCOME (nonearned income by black), BCHILDREN0-2, BCHILDREN3-5, BEDUC, BMOTHER'S WAGE and BFATHER'S WAGE.

Table 5

Trichotomous Logit Explanation of Single Mothers'  
Labor Supply, Coefficients, (Standard Errors)

	Parttime Work vs. Fulltime Work	dp/dx	No Work vs. Fulltime Work	dp/dx	Means
CONSTANT	1.925 (0.512)		-0.538 (0.285)		
LIMITATION	0.531 (0.272)	0.087	0.467 (0.286)	0.039	0.063
PULMONARY CARDIAC	0.485 (0.260)	0.071	0.574 (0.271)	0.058	0.066
METABOLIC DIGESTIVE	0.065 (0.329)	0.015	-0.021 (0.344)	-0.007	0.042
PSYCH	0.128 (0.302)	0.028	-0.010 (0.316)	-0.009	0.047
ALL*STAY	0.683 (0.483)	0.142	0.102 (0.485)	-0.025	0.026
INF*BED	-0.177 (0.483)	-0.005	0.274 (0.448)	0.053	0.020
PROB. INSURANCE	-1.344 (0.951)	-0.184	-1.786 (1.042)	0.193	0.650
PROB. MEDICAID	0.422 (0.127)	0.071	0.351 (0.0136)	0.028	0.543
BLACK	2.076 (0.781)	0.377	1.219 (0.873)	0.613	0.42
EDUCATION	-0.194 (0.043)	-0.045	0.048 (0.042)	0.019	1.91
CHILDREN0-2	1.173 (0.181)	0.232	0.387 (0.213)	-0.002	0.223
CHILDREN3-5	0.448 (0.161)	0.093	0.069 (0.273)	-0.016	0.324
BEDUC	-0.149 (0.066)	-0.026	-0.101 (0.070)	-0.006	
BCHILDREN0-2	-0.569 (0.253)	-0.114	-0.167 (0.304)	0.009	

Table 5

Trichotomous Logit Explanation of Single Mothers'  
Labor Supply, Coefficients, (Standard Errors)

BCHILDREN3-5	0.122 (0.231)	0.0233	0.055 (0.273)	0.001	
log L -1461.80					
N <sub>1</sub> (no work)=485 N <sub>2</sub> (part time)=301 N <sub>3</sub> (full time)=788					

Table 6

Trichotomous Logit Estimation of Married Mothers'  
Labor Supply, Coefficients, (Standard Errors)

BEDUC	-0.152 (0.075)	-0.028	-0.035 (0.073)	0.004	
BCHILDREN0-2	0.023 (0.264)	0.032	-0.398 (0.275)	-0.081	
BCHILDREN3-5	0.206 (0.264)	0.088	-0.693 (0.317)	-0.151	
BINCOME	-1.0E-04 (4.0E-04)	-2.0E-06	-5.0E-05 (3.0E-04)	-2.0E-07	
BFATHER'S WAGE	-0.054 (0.037)	-0.007	-0.054 (0.037)	-0.007	
log L -2446.80					
N <sub>1</sub> (no work)=649 N <sub>2</sub> (part time)=668 N <sub>3</sub> (full time)=1140					



Table 6

Trichotomous Logit Estimation of Married Mothers'  
Labor Supply, Coefficients, (Standard Errors)

	Parttime Work vs. Fulltime Work	dp/dx	No Work vs. Fulltime Work	dp/dx	Means
CONSTANT	-.0669 (0.501)		1.497 (0.471)		
LIMITATION	-0.021 (0.239)	0.010	-0.205 (0.256)	-0.039	0.046
PULMONARY CARDIAC	0.332 (0.243)	0.026	0.532 (0.242)	0.081	0.048
METABOLIC DIGESTIVE	0.774 (0.282)	0.082	0.950 (0.281)	0.133	0.039
PSYCH	-.0231 (0.275)	-0.053	0.119 (0.268)	0.039	0.038
ALL*STAY	-0.037 (0.398)	-0.031	0.341 (0.363)	0.069	0.020
INF*BED	0.349 (0.339)	0.023	0.617 (0.327)	0.097	0.025
PROB. INSURANCE	0.095 (0.910)	0.202	-2.627 (0.902)	-0.524	0.670
FATHER INSURED	0.251 (0.115)	0.008	0.565 (0.124)	0.093	0.690
EDUCATION	-0.024 (0.027)	0.006	-0.147 (0.027)	-0.027	12.49
BLACK	1.293 (0.865)	0.206	0.587 (0.859)	0.025	0.157
CHILDREN0-2	0.201 (0.099)	-0.007	0.652 (0.097)	0.114	0.373
CHILDREN3-5	0.103 (0.098)	0.088	0.542 (0.096)	-0.151	0.365
NONEARNED INCOME	3.0E-05 (8.0E-05)	-2.0E-06	2.0E-04 (8.0E-05)	2.0E-06	2053.00
FATHER'S WAGE	0.019 (0.012)	-0.0002	0.056 (0.011)	0.010	11.13

Table 7

Estimation of Annual Weeks Worked, Selectively Adjustment, for Single Mothers  
and Married Mothers, Coefficients and Standard Errors

Variable	Single Mother	Mean	Married Mother	Mean
CONSTANT	45.944 (5.685)		37.409 (3.525)	
AGE	0.210 (0.093)	33.7	0.232 (0.077)	34.10
LIMIT	-1.235 (2.119)	0.057	-1.639 (1.805)	0.041
PULMCAR	-4.428 (2.033)	0.059	-0.937 (1.733)	0.045
METADIG	1.088 (2.338)	0.043	1.099 (2.242)	0.028
TRAUMA	0.601 (2.168)	0.050	-4.056 (1.644)	0.048
PSYCH	-0.119 (2.184)	0.050	-3.342 (1.897)	0.036
ALLSTAY	4.288 (3.758)	0.017	3.937 (2.692)	0.017
INFBED	-9.477 (3.173)	0.023	1.826 (2.551)	0.021
EDUC	-0.554 (0.341)	12.4	-0.217 (0.259)	12.7
BLACK	0.014 (8.877)	0.405	-6.615 (8.877)	0.190
MOTHER'S WAGE	0.413 (0.153)	6.80	0.578 (0.104)	7.25
FATHER'S WAGE			-0.091 (0.098)	10.82
NONEARNED INCOME	-3.0E-05 (1.0E-04)	198.41	1.0E-05 (6.0E-05)	1973.61
CHILDREN0-2	2.187 (2.275)	0.192	-2.587 (1.203)	0.328
CHILDREN3-5	2.320 (1.467)	0.289	0.715 (1.013)	0.321

Table 7

Estimation of Annual Weeks Worked, Selectively Adjustment, for Single Mothers  
and Married Mothers, Coefficients and Standard Errors

PROFMGR	2.509 (1.278)	0.242	2.839 (0.932)	0.289
MANUF	1.012 (1.398)	0.158	0.193 (1.045)	0.158
SALES	-0.657 (1.362)	0.188	-0.956 (0.979)	0.194
SVCS	-4.395 (1.503)	0.134	-5.530 (1.257)	0.095
BAGE	0.226 (0.093)		0.204 (0.141)	
BEDUC	-0.379 (0.509)		0.311 (0.421)	
BMOTHER'S WAGE			-0.385 (0.217)	
BFATHER'S WAGE			-0.407 (0.233)	
BINCOME	-1.0E-04 (0.001)		1.0E-04 (3.0E-04)	
BCHILDREN0-2	-0.683 (2.530)		2.511 (1.885)	
BCHILDREN3-5	0.051 (2.113)		-2.114 (1.897)	
MILLS RATIO	-21.672 (3.995)		-5.395 (3.929)	
adjusted R <sup>2</sup>	0.13		0.11	
N	1036		1551	
Mean Weeks Worked: Single Mothers: 40.93 Married Mothers: 43.12				

**Changes in Working Time in Canada and the United States.  
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## **Session 1 (v)**

**Hours Constraints: Theory, Evidence  
and Policy Implications**

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W.E. Upjohn Institute for Employment Research.**





## HOURS CONSTRAINTS: THEORY, EVIDENCE AND POLICY IMPLICATIONS

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## I. Introduction

In response to persistent unemployment, particularly in Europe, there have been calls for work-sharing. Implicitly, advocates of work-sharing believe that the demand for hours of work is inelastic and independent of the number of workers used to fill those hours. Therefore overall employment can be increased by reducing the number of hours that each individual works. To take a simple example, if the work-week is reduced from 35 hours to 31.5, in order to have the same number of hours of work, firms would have to increase employment by one-ninth. In an economy with 12% unemployment (88% employment), this would increase employment by almost ten percentage points and reduce the unemployment rate to a little more than 2%.

The view that modern workers would actually like to reduce their work hours adds to the attractiveness of this proposal. Juliet Schor's The Overworked American has proved enormously popular. Despite stinging criticism from academic economists, the book appeals to professional women, many of whom are in dual-career families and feel caught between the high demands of their jobs and their families.

The Canadian Report of the Advisory Group on Working Time and the Distribution of Work (1994) takes a more cautious approach. It suggests that about half of sustained reductions in overtime eventually are translated into new jobs. On the basis of this and other arguments, it recommends reducing the legislated standard work week to forty hours in those provinces where the legislated standard exceeds forty. In addition, it recommends giving employees the right to refuse to work more than forty hours per week. Finally, it recommends allowing a maximum of 100 hours of compensated overtime per year.

Additional overtime would have to offset by reduced hours at other times. In effect, it ~~therefore recommends a legislated maximum work week of forty-two hours.~~ We note in passing that this would be the maximum time spent per week on *a single* job. Many people hold more than one job, and such legislation will undoubtedly increase these numbers.

It is relatively easy for economists to dismiss both the calls for work-sharing and Schor's book. In a simple model of hours determination, hours are set optimally. Any interference with the market must reduce welfare. Indeed, it is trivial to produce examples in which reducing the work week actually reduces employment, suggesting that there might not even be an efficiency/equity trade-off.

Moreover, the view that unemployment should be lowered by reducing the work week comes up against the perception of many workers that they are underemployed. Most workers do not want to reduce work hours in return for a proportionate reduction in pay. The overwhelming evidence from both the United States and Canada is that far more workers would like to increase their hours than would like to decrease them although the evidence is more mixed for Europe. Thus where some see work-sharing as a solution to unemployment, others see it as exacerbating underemployment.

Despite the weakness of the case for work-sharing, we should not be blind to the deficiencies of the economists' case against it. The models which are used implicitly or explicitly to show that reducing the work week need not increase employment and therefore may not reduce unemployment are models in which the labor market clears, employment is efficient and there is no unemployment. Having assumed away unemployment, it is difficult to see how we can evaluate programs designed to reduce it.

In this paper, we do not claim to resolve the issue of whether work-sharing is a viable mechanism for reducing unemployment. Our goals are more modest. We seek to understand the nature of "hours constraints", i.e. of people desiring to work a different number of hours than they actually do. We do so with two objectives in mind. The first is to assess whether hours constraints are indicative of some sort of problem in the labor market, particularly one of underemployment. The second is to use the information on hours constraints to further our understanding of the functioning of the labor market. We summarize the evidence on the extent of hours constraints and attempts to test various theories as to their origins. We conclude by returning to the question of work-sharing.

## II. The Extent of Hours Constraints

Survey research on whether Americans would like to work more, fewer or the same number of hours dates back to at least 1966. Since then five surveys have asked comparable questions regarding desired work hours.<sup>1</sup> Table 1 gives the results of these surveys. All five surveys reveal the same general tendency. Somewhat more than 40% of respondents would like to change their hours of work. Of these, a clear majority want more not less work. Differences in the samples make it difficult to draw strong conclusions about trends.

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<sup>1</sup>We exclude proprietary surveys for which basic information on question-wording and sample design are not available and questions that do not explicitly suggest an earnings/hours trade-off. A 1993 Gallup Poll asked workers their actual and desired hours. Mean actual hours were reported as 42.5 while desired hours were 36.7. However, sixteen percent of workers responded that they preferred zero hours. Given the prohibition on slavery in the United States, it is unlikely that employers were forcing these people to work. Instead, we must assume that these respondents were not thinking of the kinds of hours/salary tradeoffs made explicit in many of the other surveys discussed here. Excluding this 16% of respondents, mean desired hours was 43.7.



The Panel Study of Income Dynamics has also monitored the relation between desired and actual hours. In the PSID workers are first asked whether more hours were available on any of their jobs. Those who could not have worked more are then asked if they would have liked to work more. Similarly, they are asked if they could have worked less and, if not, whether they would have liked to work less. One weakness of the PSID is that some salaried workers respond that they could have worked more but in a subsequent question reveal that they would not have been paid for the work. Nevertheless, these workers are not asked if they would have liked to have worked more in return for more pay.

Despite this weakness, the PSID has the advantage of offering a consistent time-series. Moreover, work by Ham (1982) and Altonji and Paxson (1988) shows that the responses to the constraints questions have predictive power for behavior. Moreover, Kahn and Lang (1992) show that for wage earners, the PSID questions give results that are similar to those obtained using the questions in the other surveys summarized in Table 1.

Table 2 presents the fractions of respondents who say they would have liked to work more or fewer hours over the period 1968 - 1987. There may be some bias in time trends in these PSID figures. The PSID, limited to household heads, follows families through time. While break-off families are added to the sample, there is a risk that part of observed time trends captures changes in household heads over the life-cycle. Additionally, in the early years, the low income population was over-sampled. However, over time, regression towards the mean in earnings has led to progressively less over-sampling of the low income population. If these two factors introduce a bias, it should push us towards finding a reduction in the desire to work more, since our work shows that older workers are less likely

and poorer workers more likely to want more work.

In fact, there is no clear trend in the data. The 1968 numbers are quite different from those of later years. Ignoring the first year of the survey generates a positive correlation between time and both wanting to work more and wanting to work less for women. For men, there is a positive time trend for wanting to work more, but it is significant at only the .1 level.

Despite the similarity of these responses to questions intended to measure the same phenomenon, there are other ways of framing the question that generate different answers. A 1978 survey (Best, 1981) asked workers what the largest portion of their current yearly income they would be willing to give up for shorter workdays (shorter workweeks, more vacation). The options offered were designed to involve proportional cuts in pay (e.g. "2 percent (1/50) of your income for 10 minutes off each workday) although given variation in the length of the workday and number of days worked each year, these may not have been exactly right. Nevertheless, 23% said they would take a pay cut for a shorter day, 26% for a shorter week and 42% for more vacation. Note, however, that no similar question inquired about possible increases in hours for additional income.

The Canadian Survey of Work Reduction (SWR), conducted in 1986, is particularly helpful for looking at the impact of question wording. While only 17.3% of Canadians responded that they would take a pay *cut* in return for more time off, 26.7% were willing to forego some or all of their anticipated pay *increase* for more time off.<sup>2</sup> The Advisory Group

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<sup>2</sup>The exact questions asked were:

- "In the next two years, would you take a cut in pay if you received more time off in return?" Follow-up if no: "Why not?" Follow-up if yes: "What percent of your pay would

on Working Time follows the Conference Board in counting all workers who answered either ~~question positively as expressing an interest in reduced hours so that 30.7% were reported as~~ preferring fewer hours. In contrast, 32.1% are recorded as preferring longer working hours (p. 87). The Advisory Group concludes that "[t]he survey strikingly captures Canadians' 'indeterminate' mood regarding working time ...." (p. 25).

There are reasons for being skeptical about the conclusion that Canadians are about equally divided among those wanting more, less and the same work. First, while there are two separate questions asking whether respondents would prefer to work less (i.e. whether they would be willing to take a pay cut for time off and whether they would be willing to forego part of their pay increase for time off), there was only a single question asking whether people preferred to work more hours for more pay (see footnote 2).

Second, many respondents give contradictory answers to these three different survey questions about hours constraints. In fact, only 12% of respondents answer all three

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you give up to have more time off?" Accompanying these questions was a table and examples to help the respondent think about how much money an x% pay cut represents, and how much time an x% hours cut represents.

- "Another way to gain more time off is to trade all or some part of your pay increase. Would you trade some of your increase in the next two years for more time off? (For example, gain 5% more time off instead of a 5% pay raise?" Follow-up if yes: "How much of your increase in the next two years would you take as time off?"

The questionnaire proceeded with a set of questions on how the person would prefer to reduce work time (e.g. fewer hours per day) and about reasons that person preferred to work less. The questionnaire then continued with:

- "If you continue to be paid at the same rate of pay that you are now, would you work **more** hours for **more** pay?" Follow-up if yes: "How many more hours per week would you want to work?"

questions in a manner consistent with wanting reduced hours.<sup>3</sup> In contrast, 27% answer that ~~they want additional work hours and do not reply affirmatively to either of the questions~~ about wanting fewer hours.

Third, respondents who "expressed an interest" in working less were asked why they were interested in less work. Over one-quarter rated avoiding being laid off as a "very important" reason for wanting to work less for less pay and over half rated this as at least "somewhat important". Almost half rated as "very important" at least one of various responses that are inconsistent with a true preference for less work: giving others a chance for work, avoiding being laid off, starting a business, looking for other work, running an existing business or working at a second job. We must therefore exercise extreme caution in interpreting the Survey of Work Reduction as revealing a desire for more leisure among a large number of Canadians.

In a similar vein, people who respond that they would like more work might actually want to cut hours in their second job but not actually work additional hours. However, only about 4% of workers who say they would like to work more actually work at second job. Even if these workers would not actually want to increase the total hours they work, this would not substantially change our estimates of the fraction of Canadians wanting more work and less leisure.

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<sup>3</sup>As mentioned above, there were people willing to forego pay increases but not to take a pay cut for time off. More strikingly, almost one-quarter of those who said they were willing to take a pay-cut said they were not willing to forego some or all of their pay increase. In addition, 25% of the people who responded that they were willing to forego their pay increase but not take a pay-cut also said that they would like to work **more** hours for more pay. Among those willing to take a pay-cut about one-eighth also said they would like to work **more** hours for more pay.

Given the difficulties of interpreting the responses to the questions regarding the desire for less work and given the fact that the survey does not inquire why individuals respond that they want to work more, we must be somewhat guarded in our assessment of the results of the survey. Nevertheless, it seems to us that the evidence suggests that Canadians are far more likely to want to work additional hours than to work fewer hours.

Similar questions have been asked in other countries. Unfortunately, the results of two major surveys, the first conducted by the International Social Survey Program (ISSP) and the second by the European Union, conflict quite sharply. Table 3 gives the results of the ISSP survey, conducted in 1989. Respondents were asked, "If you had a choice, would you prefer to work: (1) the same number of hours and earn the same money; (2) fewer hours at the same rate of pay and earn less money, and; (3) more hours at the same rate of pay and earn more money?"

As noted in the discussion of table 2, responses to this question for the United States are similar to those obtained in other years with comparable questions. In table 3, the United States looks similar to other OECD countries. It has a relatively high fraction of workers who want to work more, but this proportion is not substantially higher than in Ireland and Italy. Similarly, relatively few Americans want to work less, but that is true of most other OECD countries. In every country, more people want to work more than less although the difference is not large in Germany.

Table 4 gives responses to the European Union survey, also conducted in 1989. The survey asked, "Assuming that your hourly rate remained unchanged, would you like to work less, as long or longer?" While this question does not appear to be significantly different



from the question used by the ISSP, the survey results are dramatically different. A large minority of workers in all countries reply that they would like to work less. The fraction wanting less work is significantly higher than the fraction wanting more in all countries.

We note some other results in the European Union survey that make the results in table 4 even more surprising. The survey also asked part-time workers whether they would prefer full-time work. The last column of table 4 gives the percentage of workers who are part-time workers and say they would prefer full-time work. In France, Italy, Portugal and Spain, the proportion of all workers who are both part-time and want full-time work exceeds the proportion who say, in response to the general question on preferred hours, that they would like to work more. While this is technically feasible if part-timers respond that they want full-time work because full-time work is compensated at a higher hourly rate than part-time work, the counter-intuitive result is concerning.

Another surprising aspect of the European Union study is the difference between answers to the question about wanting more or fewer hours of work at their presently hourly rate and answers to a question regarding willingness to trade pay raises for shorter hours. In the Canadian Survey of Work Reduction described above, respondents are somewhat but not dramatically more likely to trade future pay raises for shorter hours than they are to trade present pay. In the European Union survey, respondents were asked "If the choice were offered in the next wage round between an increase in pay for the same hours of work and shorter working time for the same pay you get now, which would you prefer?" The correlation across countries between the percentage answering "less" to the first question and the percentage answering "shorter working time" to the second question is only .05, although

the average across countries is not very dissimilar (34% versus 30%).

While there is no formal contradiction among the different answers to the three questions, we find these differences disturbing. However, the high number of Europeans desiring shorter hours in the EU survey seems corroborated by the British Household Panel Survey (BHPS) of 1991 which asked "Thinking about the hours you work, assuming that you would earn the same amount per hour as at present, would you prefer to: Work fewer hours than you do now; Work more hours than you do now; Or carry on working the same number of hours?" Among male employees age 21-64, 36% respond fewer, 7% more and 56% the same (Stewart and Swaffield, 1995), results quite similar to the EU survey's. We find the face validity of the BHPS to be the greatest of the three surveys, since it seems to make it clearest to the respondent that the hourly rate would be unchanged. The contradictions within the EU survey and between the EU and ISSP surveys remain a matter of concern.

Finally we note that older European surveys indicate that wanting more work is more common than wanting less work. Katona et al (1971) report the answers to the question "Some people would like to work more hours per week if they could be paid for it. Others would prefer to work fewer hours per week even if they earned less. How do you feel about this?" In all four European countries surveyed (United Kingdom, Germany, Netherlands, France) wanting to work more was substantially more common than wanting to work less.

In part because of the importance of phrasing, economists are inclined to be skeptical of answers to hypothetical questions such as those used in all of these survey questions on preferred hours. Unfortunately, in North America there is only limited experience with organizations allowing workers to voluntarily reduce work effort in return for a pay

reduction. Nevertheless, it does not support the finding that a large fraction of the population would give up income for more vacation. Best (1981) reports that faced with severe budget cutbacks in 1976, Santa Clara County, California offered workers the option of a 5%, 10% or 20% pay reduction in return for an increase of 10.5, 21 or 42 days of vacation. We note that, given the existence of holidays and fixed fringe benefits this is somewhat more favorable to workers than a proportionate reduction in compensation. Seventeen percent of workers increased their vacation. Best also reports that about 16% of lawyers in the Public Defender's Office take a three-month sabbatical each year in return for a 25% salary reduction. Since interest in less work is more common among higher earning workers in both U.S. and Canadian surveys, these experiences do not suggest a large latent demand for reduced work hours.

Perhaps the most extensive test was in New York state government which, in 1984 adopted a system of voluntary reduction in work schedules, or V-time. This offered full-time employees the opportunity to reduce by 5 to 30 percent their work schedules and salaries while remaining in their career-path positions. Leave time and pensions were prorated. Subject to their supervisors' approval, employees could reduce their workday or workweek on a regular basis, take time off intermittently, or "bank" time for use at a later date. The official program guidelines did not specify any "acceptable reasons" for requesting V-time nor did the application even ask for reasons. V-time was not a once-and-forever choice. Workers could request a V-time arrangement to last for as long or short a period as they wished. Many employees were eligible for V-time, including professional, scientific, technical, managerial and "confidential" employees.

From the perspective of trying to discover a latent demand for reduced working hours, the program ~~could hardly have been more ideal~~. Its extreme flexibility gives employees themselves the choice of the timing and duration of cutbacks. Nevertheless, very few people actually requested V-time. The number of participants never represented more than 2% of employees in the jobs covered by the program. The most common uses of V-time were for temporary maternity and family leaves. As of October 1993, there were only 588 V-time participants, less than 1% of the total employees in these jobs.

### III. Theories of Hours Constraints

There is relatively little information on the actual number of hours that individuals would like to work. Kahn and Lang (1995) report that the average Canadian would like to work an additional three hours per week. The implied loss in hours is about 8% of total hours worked, comparable in magnitude to the loss in worktime due to unemployment. Understanding hours constraints is therefore potentially extremely important. If hours constraints represent an efficiency loss, the welfare gains are potentially quite large. Conversely, if hours constraints are efficient, they may tell us a great deal about the nature of labor markets. Below we summarize the three primary theories advanced in the literature that may explain why workers may be constrained to work more or less than they desire.<sup>4</sup>

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<sup>4</sup>A fourth theory of hours constraints predicts only over-employment, rather than both over and under-employment. In a recent paper, Rebitzer and Taylor (forthcoming) have developed a clever explanation of why there might be a shortage of short-hour jobs in certain occupations. The motivation for their model is law associates. In essence Rebitzer and Taylor argue that requiring long hours is a screening device for individuals with low disutility of effort. Since potential partners care about being part of a firm with hard-working partners and since partner effort is difficult to monitor, law firms benefit from requiring that associates



### Long-Term Contracting

Lazear (1979, 1981) has argued that long-term contracts lead to a divergence between the wage and the value of marginal product (VMP). This leads to a conflict between the hours that would be chosen by the worker and firm. Workers will wish to work until marginal value of leisure equals the wage. Firms will want workers to work until their value of marginal product for the last hour worked equals the wage. Efficiency requires that hours be set so that the marginal value of leisure equals the value of marginal product for the last hour worked. If the value of marginal product from an hour worked is independent of hours worked, it follows that whenever the wage exceeds VMP, workers will be constrained to work less than they want. Conversely, when VMP exceeds the wage, workers will be constrained to work more than they want.

Lazear develops his argument in the context of an agency model, but it is quite general to models of lifetime contracting. In the agency model workers post a bond in the form of a low starting wage. The bond is later returned to senior workers in the form of wages that exceed the value of marginal product. Thus, in the agency model junior workers should be constrained to work more than they wish while senior workers should be constrained to work less than they wish.

In contrast, in many specific-capital models (Becker, 1975), workers and firms share in the investment so that junior workers are paid more than their VMP. The firm recoups its

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work long hours. Provided that disutility of effort and disutility of hours on the job are correlated, reducing hours may create an adverse selection problem by attracting less hard-working individuals to the firm. This model may well be valid for certain occupations, but is not pursued here because it does not address the desire to work additional work hours.



investment by paying senior workers less than they are worth. Thus, in the specific-capital model, junior workers should be constrained to work less than they wish while senior workers should be constrained to work more. More details of the arguments concerning the agency and specific-capital models are developed in Kahn and Lang (1992, 1995).

Other long-term contracting models also imply hours constraints. For example, in Harris and Holmstrom (1982), firms and workers are uncertain about how productive the worker will turn out to be. Firms offer insurance contracts in which they promise not to reduce wages. Information about productivity is revealed gradually to the market. Workers who turn out to be unproductive end up being overpaid while the wages of more productive workers are bid up. As with other long-term contracting model, this can be shown to imply hours constraints. *On average*, low seniority workers are underpaid, because firms are collecting insurance premiums. However, on average high seniority workers are overpaid, because firms have stopped collecting insurance premiums and are making insurance payments to low productivity workers. Consequently, *on average* more senior workers will be more likely to be constrained to work less than they wish.<sup>5</sup>

In general, models of long-term contracting in which wages rise faster than VMP (e.g.

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<sup>5</sup>Strictly speaking, only workers in the final work period have stopped paying insurance premiums and only in this period are high productivity workers paid exactly their marginal product. In other years, they are underpaid because of insurance premia.

Allowing mobility reinforces the tendency for more senior workers *on average* to be paid more than their marginal product and hence to prefer more work hours. Workers who are revealed to be high productivity will be indifferent among all firms. In contrast, workers who are revealed to be overpaid will prefer employment at their present employer. Under these circumstances, it is sensible to assume that the highly productive workers are more likely to change jobs than are less productive, overpaid workers, further adding to the average overpayment of senior workers.

agency, Harris/Holmstrom) will imply that the tendency to want additional hours will rise with seniority. Models in which VMP rises more rapidly than wages (e.g. specific capital) will imply that the tendency to want additional hours falls with seniority.

### Hedonic Models of the Wage-Hours Locus

For most people, going to work involves substantial fixed costs. Regardless of how long the individual remains at work, s/he incurs the cost of commuting. Once at work, there may also be set-up costs -- it takes time to boot the computer. Therefore it is not very surprising that we do not observe many workers who are employed for extremely short time periods. A worker who was employed for only five minutes per day would generally produce little or nothing but would require compensation for commuting time. Such a worker would demand a high hourly wage. The firm would only be willing to offer a very low hourly wage.

At the other end of the spectrum, workers who worked very long hours would suffer from fatigue. The workers would require very high wages to compensate them for working such long hours. On the other hand, firms would be unwilling to pay high hourly wages to such workers, because their average hourly productivity would be low.

More generally, if we were to plot the average *hourly* wage workers would require to compensate them for different weekly hours of work (i.e. their indifference curves in wage/work-hours space), we would expect the indifference curves to be U-shaped with moderate hours of work requiring less average hourly compensation than very short or very long work weeks. In contrast, if we were to plot the average hourly pay firms would be

willing to pay for differently weekly hours of work (i.e. their iso-profit curves in wage/hours of work space), we would expect them to be hump-shaped with moderate hours of work compatible with higher average hourly wages than either very long or very short work weeks.

If all workers and all firms are identical, the points of tangency between the indifference curves and isoprofit curves form the contract curve. With free entry, the point that will be chosen is the one where the indifference curve is tangent to the zero-profit isoprofit curve. This point is efficient. Given the options available, no worker or firm wants to change hours.

When workers and firms are heterogeneous, the tangencies of the indifference and isoprofit curves will trace out a hedonic wage/hours locus. Workers who want short hours will be matched with jobs in which short hours are relatively advantageous to the firm. The shape of the wage/hours locus is largely indeterminate. It may be linear, hump-shaped, U-shaped or wiggly.

Regardless of the shape of the wage/hours locus, each firm offers a job with the most profitable wage/hours combination given the locus. Each worker chooses his or her most preferred job given the same wage/hours locus. Again, the equilibrium is efficient, and no worker or firm want to change hours.

However, the survey questions described in the previous section typically do not ask workers whether they would prefer to move to a different spot along the wage/hours locus. Instead they ask if workers would like to change hours if they could work at the same hourly rate. Since workers may not have the option of working a different number of hours at the same hourly rate in the hedonic model, they may well prefer to change hours if given this

option.

In order to know whether they will want more or fewer hours at their usual hourly wage, we need to examine the relation between their marginal wage and their average hourly wage. Workers choose to work up to the point at which the marginal wage is equal to their marginal value of leisure. If the average wage exceeds the marginal wage, it will therefore also exceed the marginal value of leisure, and they will desire additional work at that wage. On the other hand, if the marginal wage exceeds the average wage, the average wage will be less than the marginal value of leisure, and workers will prefer to reduce their hours if they can do so at their average hourly wage.

Whenever the average hourly wage is greater than the marginal wage, the hourly wage will be declining with hours worked. Conversely, if the average hourly wage is less than the marginal wage, the hourly wage will be increasing with hours worked. Therefore, the hedonic model predicts that workers will want more hours if they are on the increasing part of the wage/hours locus and less work if they are on the decreasing part.

### Models with Rigid Wages

Hours constraints may arise when workers and firms sign fixed-wage contracts that allow firms to set hours. While fixed-wage contracts are commonly seen empirically, they lack a theoretical foundation. Although insurance-based models would seem the logical theoretical underpinning for fixed-wage contracts, these models suggest that salary, not wages, should be fixed. Similarly, efficiency wage models imply efficiently set wages rather than fixed ones.

Despite its theoretical deficiencies, a fixed-wage model is attractive, because it suggests that hours constraints can be viewed as a continuum of which unemployment is an extreme. Without a ~~formal~~ theoretical model, it is impossible to make firm statements as to the predictions that follow from this view of hours constraints. Nevertheless, we would expect that in such a model, the desire to work less would be positively correlated and the desire to work more negatively correlated with measures of excess demand in the labor market.

#### IV. Evidence For and Against the Theories

##### Long-Term Contracts

Kahn and Lang (1992, 1995) report that in both the PSID and the Canadian SWR, the desire to work additional hours is negatively related to seniority. We provide some representative results from the Canadian data in Table 5. Almost half of the most junior workers want *more* work compared with only about 20% of the most senior workers. In contrast, only about 10% of the most junior workers but twice as many senior workers want to work *less*. The correlation between seniority and the constraints is supportive of models such as the firm-specific capital model in which wages grow less rapidly than VMP.

On the other hand, at no seniority level does the average worker want less work or does the number of workers wanting less work exceed the number wanting more work. This suggests that long-term contracting cannot be the sole explanation for hours constraints. If it were, the results would imply that wages exceed VMP at all levels of seniority which is inconsistent with profit maximization.



### The Hedonic Model

The distribution of actual hours appears to be responsive to desired hours, suggesting that matching takes place in the labor market as predicted by a hedonic model. Kahn and Lang (1995) report that usual hours ~~worked~~ increase by half an hour for every hour increase in desired hours. This is true both for individuals and for mean usual and desired hours across provinces. In a sample of eleven European countries, the fraction of workers who want to work more than 45 hours is correlated ( $r = .42$ ) with the fraction who actually work more than 45 hours and even more so if we exclude Portugal ( $r = .80$ ). The correlation between the fraction wanting to work less than 20 hours and those actually working less than 20 hours is even greater ( $r = .94$  including Portugal).

On the other hand, the matching seems to be only imperfect inasmuch as it improves over time. In the Canadian results reported in the first part of Table 5, the fraction of workers who do not want to change their work hours rises from 43% among the lowest tenure group to 58% among the highest tenure group. This suggests that either workers adjust their tastes over time or that dissatisfied workers leave in order to find jobs whose hours requirements conform better to their tastes. Using the PSID, Altonji and Paxson (1988) find that U.S. workers' responses regarding desired hours help predict whether workers shift to longer or shorter hour jobs.

Additional evidence suggesting only imperfect hedonic matching is found in the fact that substantial fractions of part-time workers would prefer full-time work and vice versa. The most obvious interpretation of these statements is that these people would prefer to be at a different point along the wage/hours locus but cannot. Thus, although the hedonic model

may give insight into how hours and wages are determined, the empirical evidence suggests that there is substantial mis-matching.

To test the hedonic model more formally, Kahn and Lang (1996) use the June 1986 Canadian SWR to estimate the wage/hours locus and an hours constraints equation simultaneously. We test whether the pattern of hours constraints conforms to the hours constraints that should be generated by the wage/hours locus under the hedonic model. A pure hedonic model is easily rejected. We do not find that workers wanting more hours are in the downward-sloping part of the wage/hours locus and those wanting fewer are in the upward-sloping part.

However, when hours constraints are allowed to depend on seniority as well as on the slope of the wage/hours locus, the empirical model fits surprisingly well. Figure 1 plots the actual wage/hours locus estimated from income and hours data and the wage/hours locus predicted on the basis of hours constraints and seniority. The curves are quite similar. In fact, the only poor fit is in the region of very long hours. Yet looking at the data, the source of this poor fit is that average *weekly earnings* actually **fall** beyond 58 hours, indicating that very long hour workers are quite different from other workers. They often hold two jobs. Many others are low tenure workers in managerial or administrative positions who are presumably investing in their careers. When individuals who are working over 60 hours per week are excluded, the equality of the two equations cannot be rejected.

Thus, we cannot reject a model of hedonic matching combined with long term

contracting due to firm-specific skills.<sup>6</sup> It is surprising that this joint model is able to fit the data so well. Both casual empiricism and the evidence cited above suggests that matching is imperfect and that improvements in matching take time. It is also difficult to reconcile the sharp spike in the distribution of hours with the pure hedonic model. To some extent, the failure to reject the hedonic model must reflect lack of power. Data difficulties force us to use relatively inefficient statistical techniques. Nevertheless, we will suggest later in the paper that the equilibrium with imperfect matching may resemble the equilibrium in a hedonic model.

### Models with Rigid Wages

Hours constraints are correlated only weakly if at all with measures of labor demand. The second part of Table 5 shows the hours constraints for (1) workers working less than usual because of short-time (reduced hours),<sup>7</sup> (2) workers working their normal hours and (3) workers working more than their usual hours. The desire to work fewer hours is most common among workers on short-time. Similarly, the desire to work more hours is most common among those working more than their usual hours. The results suggest that in periods of low demand, workers who want to work fewer hours take advantage of the situation to reduce their hours. In periods of high demand, workers who want additional hours are able to increase their hours. Thus, hours constraints cannot be interpreted as

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<sup>6</sup>Note that in this estimation, seniority decreases the desire to work more hours, consistent with the firm-specific capital model.

<sup>7</sup>Thus we exclude individuals who are working less than their usual hours for reasons such as ill health, vacation, etc.

cyclical under-employment being imposed on unwilling workers.

The relation between measures of aggregate demand and hours constraints is weak. Across provinces there is a positive relation between average additional hours of work desired and the unemployment rate, but it falls well short of conventional significance levels (Kahn and Lang, 1995). Similarly, in the PSID, controlling for other factors, the local unemployment rate is positively related to the desire for more work, but the coefficient is generally insignificant (Kahn and Lang, 1992). Using aggregate data from the PSID in table 2, there is some evidence of a relation between the prevalence of hours constraints and the national unemployment rate. The proportions of both men and women wanting to work more are positively correlated with the civilian unemployment rate for men age twenty and over although this result is not robust to including a time trend in the case of women. On the other hand, the proportion wanting to work less is not significantly related to the unemployment rate and the correlation is positive.

Hours constraints, however, are related to recent *personal* unemployment experience in both the Canadian and U.S. data even controlling for experience and seniority (Kahn and Lang, 1992, 1995). One explanation for this result is that workers who obtained their jobs after an unemployment spell are less well matched than those who "chose" new jobs and experienced no intervening unemployment. A second explanation could be that people tend to want long hours after an unemployment spell because they have run down their assets, but that mis-matching makes it unlikely that they actually obtain these long hours.

## V. Hours Constraints, The Distribution of Hours and Unemployment

In sum, it appears to us that hours constraints are best understood in the context of a matching model in which wages do depend on hours as in hedonic models but in which the matching is imperfect. (There may also be long-term contracting.) Since imperfect matching can lead to unemployment and vacancies, both because workers may not be matched with any firm or the match may offer no surplus, understanding hours constraints would also allow us to evaluate a policy of mandated hours constraints in the context of a model in which unemployment actually can arise.

In this section, we take some tentative steps towards analyzing the impact of mandated hours reductions in the context of such a model. The model we use is a simple extension of the Butters (1977) equilibrium search model. We describe it only informally.

In labor market variants of the model (Hosios, 1986; Lang, 1991), each firm decides simultaneously whether or not to make an offer to a worker and, if so, what wage to offer. Making an offer entails paying a fixed cost. Under certain circumstances this may be interpreted as the cost of renting a machine prior to trying to hire a worker. The worker chooses the firm that offers him or her the highest wage. Because some workers may get only one offer and others may get multiple offers, the equilibrium involves a wage distribution. Each firm recognizes that offering a higher wage raises the probability of hiring the worker but lowers profits conditional on getting the worker. Because some workers randomly fail to receive any offers, there is unemployment. Similarly, some firms' offers are turned down, resulting in vacancies.

To take account of hours constraints, we extend the model in a simple way. First, we



assume that firms make tied wage-hours offers. The worker chooses the firm offering him or her the highest utility level provided that utility level exceeds some reservation utility level. For simplicity, we assume that the value of marginal product per hour  $v$  is independent of hours worked and that the utility function is given by  $u = \log(wh) + (T-h)/\beta$  where  $wh$  is (labor) income,  $h$  is hours worked while  $(T-h)$  is leisure. This utility function has the property that desired work hours equal  $\beta$  and are independent of the wage rate.

We note that the resulting equilibrium is very much a theoretical counterpart to Dickens and Lundberg's (1993) study of constrained labor supply in that workers receive a limited and stochastic number of wage/hours offers from which to choose. In contrast with that paper, we allow for unemployment.<sup>8</sup>

The firm chooses  $w$  and  $h$  to maximize expected profits which are given by

$$(1) \quad E(\pi) = P(u) (v-w) h - d$$

where  $u$  is the utility associated with the offer,  $P$  is the probability of the offer being accepted and  $d$  is the fixed cost of making an offer. The equilibrium is characterized by a distribution of wages and hours, and of utilities with corresponding values of  $P$ .

It is relatively straightforward to prove the following:<sup>9</sup>

- a. All firms offer hours in excess of  $\beta$ . In other words, all workers would respond that they would want to work less at their usual hourly wage.

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<sup>8</sup>Dickens and Lundberg is primarily an empirical paper but incorporates a structural model. Because their data set included only employed people, they did not model unemployment.

<sup>9</sup>Differentiate (1) with respect to both  $w$  and  $h$ . Dividing one first-order condition by the other and rearranging terms gives  $w = \beta v/h$ . Since firms can only make profits if  $w < v$ , this requires that  $h > \beta$ . Moreover, it implies that  $wh = \beta v$ , a constant.

b. There is a distribution of hours and wages. The hourly wage is monotonically declining in hours. In fact,  $wh$  is constant.

If we were to observe the facts (a) and (b) without the perspective of the model, the logic for mandating hours restrictions would seem compelling. Workers want shorter hours. If hours could be reduced but salaries maintained (i.e.  $wh$  constant), this even suggests that firms are equally happy with both situations. Moreover, the quantity of labor demanded would rise, thereby reducing unemployment.

Unfortunately, within the context of the model, that policy assessment turns out to be completely wrong. Again, it is relatively easy to show within the context of the model that: [For sketch of proof, see Appendix].

- a. Mandating lower hours increases unemployment.
- b. Mandating lower hours decreases wages.
- c. Mandating lower hours is welfare deteriorating in the sense of Pareto.

Thus, in contrast to the conclusion we might be tempted to draw, mandated hours restrictions will not be desirable. The Appendix works out a numerical example that illustrates these results.

Our choice of utility function and production function were designed to generate an equilibrium in which workers express a desire to work fewer hours. We chose this example because we believe that this equilibrium would appear to provide a strong **a priori** case for mandated hours restrictions when examined atheoretically. It is easy to choose utility and production functions such that workers desire to work more hours at their usual hourly wage.

In order to extend the model to take account of imperfect matching, we would have to

take account of variation in tastes. We believe that at the cost of some complexity, we could extend the model to allow for heterogeneous preferences. Because each worker must choose from only a limited number of jobs, matching would be imperfect. Nevertheless, workers preferring low-hours jobs would tend to end up in jobs with low hours since they would take these whenever a choice was available. We expect that our main message would still apply -- mandated hours restrictions would tend to increase unemployment and lower welfare.

## VI. Implications for Mandated Hours Restrictions

Neither the empirical nor the theoretical case for mandating hours restrictions is compelling. In the United States and Canada, there is very little evidence that workers are interested in accepting less pay in return for more leisure. The situation in Europe may be different.

In the introduction to this paper, we argued that we cannot evaluate theoretically a policy designed to lower unemployment within the context of a model which assumes away unemployment. Neither the long-term contracting nor the hedonic matching model predicts any unemployment, while "models" of rigid wages have no theoretical underpinnings with which to evaluate policy. However, the imperfect matching model sketched in Section V predicts both hours constraints and unemployment. We have established that such models do not justify casual support for mandated hours restrictions. Indeed, our simple model suggests that they may be welfare-deteriorating and lead to wage losses and even more unemployment.

Moreover, any attempts to legally reduce the work week will undoubtedly increase the pervasiveness of dual job-holding, at least within the U.S. and Canada. Whatever theoretical

model is assumed, there is also likely to be a change in the wages paid for jobs with different levels of required hours. Any analysis of the effect of mandated hours restrictions must take these effects into account.

TABLE 1

DESIRE TO WORK MORE, FEWER OR THE SAME HOURS IN THE U.S.  
(selected surveys)

	<u>More</u>	<u>Less</u>	<u>Same</u>
1966 <sup>1</sup>	34	10	56
1978 <sup>2</sup>	28	11	61
1985 <sup>3</sup>	28	8	65
1991 <sup>4</sup>	33	6	62
1995 <sup>5</sup>	26	14	55

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<sup>1</sup>George Katona and his associates, sample of household heads (Katona et al., 1971). The exact question was "Some people would like to work more hours a week, if they could be paid for it. Others would prefer to work fewer hours per week even if they earned less. How do you feel about this?"

<sup>2</sup>Conducted by Louis Harris Associates, sample of employed civilians, 17 and over. The question was "If you had a choice, would you prefer to work the same number of hours and earn the same money, fewer hours at the same rate of pay and earn less money or more hours at the same rate of pay and earn more money?"

<sup>3</sup>Current Population Survey supplement, sample of employed persons, 17 and over (Shank, 1986). Question identical to note 2 above.

<sup>4</sup>International Social Survey Programme. This survey asked, "Think of the number of hours you work and the money you earn in your main job, including regular overtime. If you only had one of these three choices, which of the following would you prefer: work longer hours and earn more money; work the same number of hours and earn the same money; work fewer hours and earn less money?" (Bell and Freeman, 1994).

<sup>5</sup>The Gallup Poll, sample of employed persons, 18 and over (*USA Today*, April 10, 1995). The exact question was "If you could, which of the following situations would you choose: Fewer hours on the job but less income, the same number of hours and income that you now have, or more hours on the job and more income?"



TABLE 2

## DESIRE FOR DIFFERENT WORK HOURS (U.S.) 1968-1987

	<u>MEN</u>		<u>WOMEN</u>	
	<u>LESS</u>	<u>MORE</u>	<u>LESS</u>	<u>MORE</u>
1968	6	14	3	13
1969	6	20	6	17
1970	3	20	5	20
1971	6	20	6	21
1972	6	20	6	19
1973	6	20	6	18
1974	5	20	6	24
1975	5	18	5	23
1976	5	20	4	24
1977	9	22	7	18
1978	4	24	7	18
1979	6	22	7	18
1980	5	21	6	20
1981	7	23	5	23
1982	6	26	6	25
1983	7	26	5	23
1984	8	22	6	23
1985	8	22	7	21
1986	6	26	6	21

30

1987

6

21

6

22

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Source: Panel Study of Income Dynamics

TABLE 3

DESIRE FOR DIFFERENT WORK HOURS<sup>1</sup>  
(various countries)

	<u>More</u>	<u>Less</u>	<u>Same</u>
Austria	23	8	68
Germany	14	10	76
Ireland	30	5	65
Italy	31	7	62
Netherlands	18	12	70
Northern Ireland	27	6	68
Norway	24	7	69
United Kingdom	24	8	68
United States	33	6	62

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<sup>1</sup>International Social Survey Program.  
 Sources: Bell and Freeman (1994).

TABLE 4

## DESIRE FOR DIFFERENT WORK HOURS IN EUROPEAN UNION

	<u>More</u>	<u>Less</u>	<u>Same</u>	<u>PT-Want Full</u>
Belgium	7	28	43	2
Denmark	9	29	61	1
France	9	39	52	10
Germany	4	38	55	1
Greece	15	28	57	11
Ireland	11	18	65	-
Italy	8	39	50	16
Netherlands	8	31	56	2
Portugal	2	49	46	10
Spain	12	42	44	15
United Kingdom	12	33	50	2

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Source: European Economy, 1991, Tables 22,23.

The first three columns give responses to the question "Assuming that your hourly rate remained unchanged, would you like to work less, as long or longer?"

The last column gives the percentage of all workers who are both part-time and answer "yes" in response to the question "would you rather have full-time employment?"

TABLE 5

PROPORTION OF WORKERS EXPERIENCING BINDING HOURS CONSTRAINTS  
BY JOB TENURE AND SHORT/OVER-TIME (CANADA)

<u>JOB TENURE</u>	<u>MORE WORK</u>	<u>LESS WORK</u>	<u>LIKING HOURS</u>	<u>N</u>	<u>No. Hours</u>
1-3 months	47.9	9.2	42.9	740	5.45
4-6 months	46.5	11.3	42.2	360	5.30
7-9 months	41.5	12.2	46.3	200	4.66
10-12 months	41.9	17.9	40.2	259	4.00
13-24 months	36.6	15.9	47.4	660	3.24
25-36 months	35.8	18.0	46.5	435	3.28
37-48 months	37.5	16.9	45.5	446	3.18
49-60 months	35.0	18.9	46.0	472	2.98
61-120 months	34.9	17.7	47.4	1598	2.80
121-240 months	25.9	20.8	53.3	1500	1.60
> 240 months	22.0	20.2	57.9	574	1.21
<u>SHORT/OVER-TIME</u>					
On Short-Time	37.4	27.0	35.6	97	4.60
Normal Hours	33.4	17.3	49.3	6167	2.88
More than Usual	39.1	16.9	44.1	980	3.17
<u>ALL</u>	34.2	17.3	48.5	7244	2.94

Source: Kahn and Lang (1995).

Based on the Survey of Work Reduction supplement to the Canadian Labor Force Survey, June 1986.

No. hours is the average number of additional hours desired by members of the group. All observations are weighted by their sampling weight. Obs is the number of unweighted observations in the category.



## APPENDIX

Consider a worker who obtained  $U_0$  in the unconstrained equilibrium. The firm chooses the profit-maximizing combination of wage/hours for that  $U_0$ . We denote the profit obtained conditional on hiring a worker achieving  $U_0$  ( $= (v-w)h - d$ ) as  $\pi_a$ . [Recall that the probability of the offer being accepted  $P$  is dependent only on  $U$ .]

When hours are constrained, if the firm were still to hire a worker who received  $U_a$ , the firm could only be earning  $\pi_c \leq \pi_a$ .

The zero profit condition requires that  $P(v-w)h = d$ . Therefore, when hours are constrained,  $\pi_c \leq \pi_a$  implies that  $P_c(U_0) \geq P_a(U_0)$ . For this to be true, the likelihood of a worker obtaining utility *greater* than  $U_0$  must be lower (or equal) when hour are constrained.

Hence, workers are worse off (or more formally, no better off) in the constrained equilibrium. This argument applies to all utility levels including the lowest utility offered, the reservation utility. If the likelihood that a worker offered the reservation utility accepts the offer is greater in the constrained solution, this must imply that the likelihood of a worker receiving a utility greater than this minimum reservation level is lower, so we will see higher unemployment rates.

It may also be helpful to work through a numerical example. Suppose that  $\beta$  equals 40 (so that workers' desired hours equal 40 as well),  $v$  equals 10 and  $d$  equals 20. We set the reservation utility so that in equilibrium the maximum number of hours in any offer is 60.

The following results can be derived:

1. All workers are offered an income of 400.
2. Hours offers range from 42 to 60; wage offers range from 6.67 to 9.52.
3. The unemployment rate is 10%.

Suppose now that hours are set exogenously at 42.

1. Wage offers range from about 6.07 to about 9.52.
2. The unemployment rate is about 12%.

Note that in a standard competitive model with this same utility function and  $v=10$ , a profit maximizing firm will set hours = 42. However, imposing this seemingly competitive solution dramatically lowers employment and wages.

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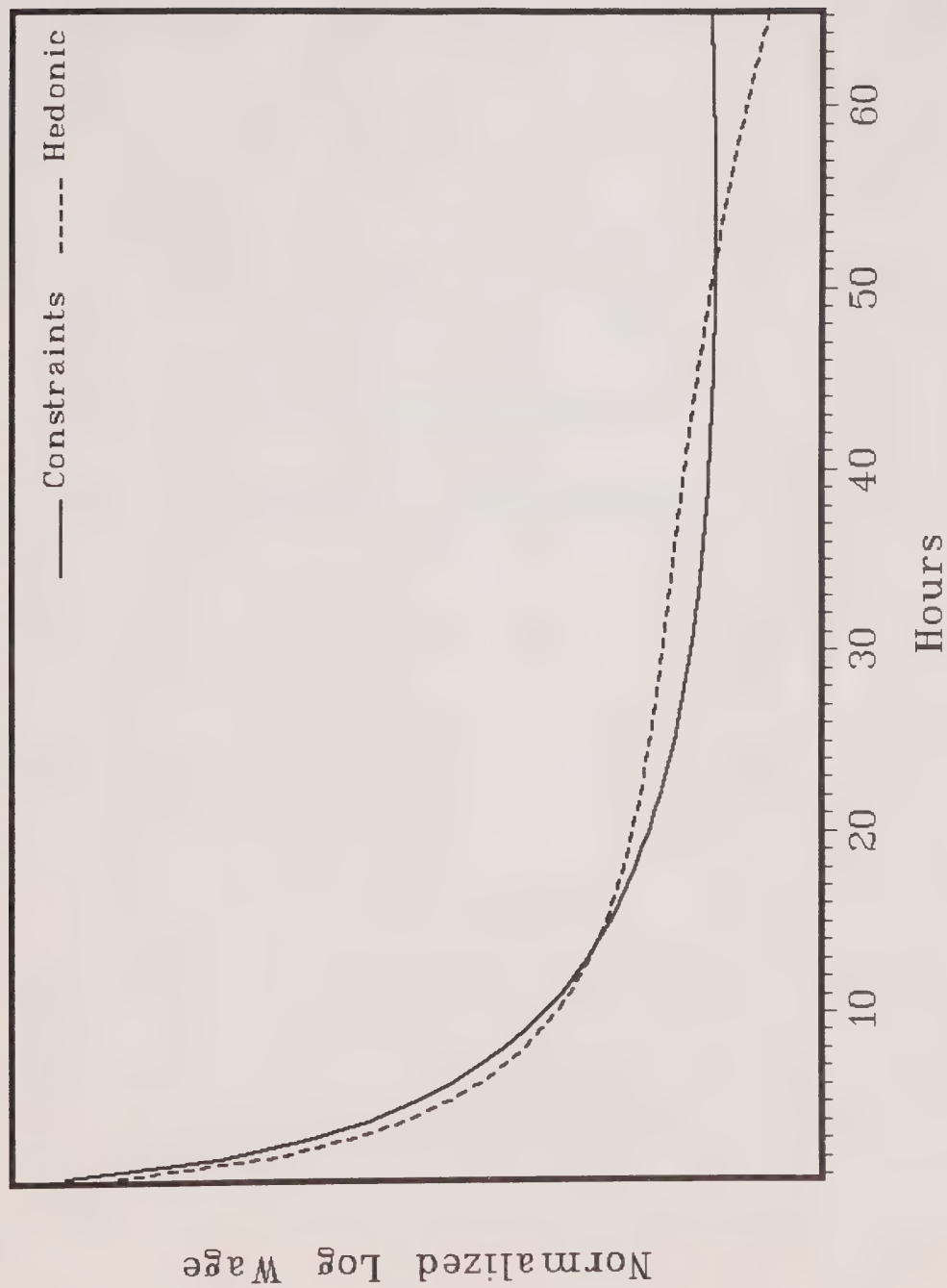
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## **Session 3A (ii)**

### **Changing Employer Staffing Practices in the United States**

Stephen Rose, U.S. Department of Labor, and  
David Fasenfest, Purdue University

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## Industry Staffing Patterns in the United States, 1989

By, Stephen J. Rose and David Fasenfest<sup>1</sup>



This work is part of a larger project on developing a methodology to understand career paths. Using data from the Panel Study on Income Dynamics (PSID),<sup>2</sup> individual workers are tracked over a ten year period. Previous findings included:

\* a declining majority of prime working-age male workers in the 1980s versus the 1970s had earnings rise over the course of 10 years;<sup>3</sup>

\* a decrease in the persistent attachment of prime working-age male workers with their firms in the 1980s compared to the 1970s;<sup>4</sup>

\* large earnings differences based on occupation of prime working-age male workers who persistently stay in the same broad occupation category.<sup>5</sup>

In this paper, career paths based on industrial continuity are followed in the 1980s. The focus is on the non-agricultural workforce, and men and women are followed separately because their career experiences are quite different. Similarly, workers of different ages and

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<sup>2</sup> For an extensive discussion of the data base and how it was created and maintained, see Martha Hill, The Panel Study of Income Dynamics: A User's Guide, Newbury Park, CA: Sage Publications, 1992.

<sup>3</sup> Rose, Stephen, On Shaky Ground: Rising Fears About Incomes and Earnings, National Commission for Employment Policy, Report No. 94-02.

<sup>4</sup> Rose, Stephen, Declining Job Security and the Professionalization of Opportunity, National Commission for Employment Policy, Report No. 95-04.

<sup>5</sup> Ibid.

occupations are tracked separately. The basic questions to be addressed are:

- \* are workers who are currently employed in an industry likely to remain in that industry?
- \* does the percent who are persistent stayers vary by industry, by gender, by age, or by occupation?
- \* do persistent stayers earn more over an extended time frame than non-stayers? And does this premium vary by industry?

The methodology to answer these questions involves collecting data on ten-year working experiences--earnings, hours worked, industry, and occupation. For example, for workers aged 32 to 57 in 1986, we can determine whether they are in the middle of a persistent stay of employment in their current industry (defined as eight out of ten years in the same industry in the decade of the 1980s) and whether stayers do better than those who are employed in the industry intermittently. For younger workers, aged 21 to 31 years old, it is better to track their experiences forward from 1981 onward because someone aged 21 in 1986 would not have been economically active in the early 1980s.

Once the various career paths are identified in terms of how many people who start or are in a specific spot are likely to be persistent stayers. Then we can determine how different industries compare in terms of their use of different kinds of labor: male and female, different ages, different pay levels, occupation, and likely industry stayers.

### Data Sets and Methodology

The 1990 March Current Population Survey is used to determine industrial employment and earnings for 1989 (a business cycle peak year). The relevant questions include: industry and occupation of longest job held, annual earnings, usual hours per week worked, and weeks worked per year.<sup>6</sup> The PSID has been tracking individuals since 1968. While it is the longest and most comprehensive longitudinal data base, it suffers from relatively small sample size. This means that only gross industrial and occupational divisions can be used. In addition, the PSID does not have good data on younger workers, and this is why we need to use the CPS to get a better, detailed description of the entire labor force in a given year.

The data are organized into eight non-agricultural industries, four occupations, four

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<sup>6</sup> Workers who hold multiple jobs or change employment during the course of a year are assigned to industries on the basis of the longest employment. It is not likely that this introduces substantial bias because those workers are not likely to be included in the category of industrial stayers nor are they likely to be highly-paid.

earnings classes, and five age groups (see Appendix Table 1 for industrial and occupation descriptions). The purpose is to have as few as categories as possible yet have a reasonable coherence within each one.<sup>7</sup>

In terms of defining “stability,” at eight years out of ten was used as the cut-off point. Most of those in the strongly-stable category are in the same industry for all ten years but the less stringent test was used. The employment patterns of non-strong stayers varies widely. Three-quarters remain in the industry five to eight years. However, there was no earnings difference these people who had some connection to the same industry and those who passed through the industry briefly (less than five years in ten in the same industry). So the data are presented as either a strong stayer or not.

### Industrial Characteristics in 1989

We begin by using the CPS to develop a brief overview of each of the industries. The largest category is professional services which include many white collar and social service activities: finance, insurance, real estate, health care and education. Fully 41 percent of all women are in these industries and this figure rises to 45 percent for women over 32 years old (not shown). Given that the activities of public administration are very similar, then the combined share of female employment in these white collar jobs rises to just under one-half all women workers.

Table 1: Employment Distribution by Industries, 1989

Industry	All	Men	Women	< 21	% Male
All					53
MINING/CONST	7.7	13	1.6	6.1	90
MAN.-DUR	13	17	7.6	6.6	71
MAN.NON-DUR	5.6	5.5	5.7	4.5	52
TCU-WHLSL	10	13	6.1	5.7	71
RETAIL	18	16	21	43	47
PERS-SERV	11	9.3	12	13.8	47
PROF-SERV	30	20	41	18.5	35
PUB-ADMIN	5.3	5.8	4.8	1.8	58

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<sup>7</sup> The industrial and occupational classifications are full of odd combinations. For example stock brokers are included with cashiers as sales workers. On the industrial side, corporate consulting firms and janitorial services are both business services. Because of the desire to have fewer categories, some obvious industries and occupations are separated from their official aggregating category to make more consistent groupings.



The male distribution of employment among industries is much less concentrated: only 20 percent of men are in professional services with another six percent in public administration. Several industries are predominantly composed of male workers: construction, mining, durable manufacturing, and transportation-communication-utilities-wholesale (TCU-W).

The industrial distribution of employment does not vary by age much among adult workers of each gender. But many young workers (43 percent), 21 years old and less, have not yet started their formal careers and are heavily concentrated in retail employment. As a result, almost a third (31 percent) of retail employment consists of these young workers.

Table 2 presents annual earnings in 1989 for the different industries for all workers and by men and women separately. Men consistently earn more than women and, in terms of all workers, the highest averages are in durable manufacturing, TCU-W, and public administration. This pattern is reflected in the average earnings of men and women separately with the exception of professional services. In this industry, the separate average earnings for men and women are high relative to other industries within each gender. The overall average does not reflect this because of the composition effect--this industry has a high proportion of relatively lower paid female workers.

Table 2: 1989 Earnings by Industries, in 1996 Dollars

	All	Men	Women	% High Men	Earners* Women
ALL	19,657	24,478	14,252	15	3
MINING/CONST	19,625	20,212	14,404	10	1
MAN.-DUR	26,987	30,378	18,520	17	2
MAN.NON-DUR	20,030	25,955	13,569	12	1
TCU-WHLSL	25,509	28,028	19,294	15	4
RETAIL	11,586	15,397	8,239	9	1
PERS-SERV	11,293	15,222	7,882	9	1
PROF-SERV	21,106	29,007	16,903	24	2
PUB-ADMIN	27,241	31,943	20,782	23	2

\* Equals percent of men and women aged 32 to 46 earnings more than \$50,000.

Another way to look at the earnings by industry is to evaluate the potential for high earnings by looking at the percent of workers aged 32 to 46 earning over \$50,000. Clearly, this goal is much more often reached by men than women. For men, the possibility of success of white-collar professionals in professional services and public administration stands out. By contrast, the 31 percent of men in this age group in mining, construction, retail, and personal services have a much lower probability of reaching this earnings level.

Table 3 presents these different industries by their occupational division. As is well known, women tend to be concentrated in clerical and sales while men are in skilled blue collar-technical-protective services. While the shares for each gender in professional/managerial and service/less skilled blue collar workers are similar, occupational segregation persists in these categories at the more detailed levels of occupations.

Table 3: Occupational Distributions, 1989

	Prof-Manger	Clerical-Sales	Sk B.C.-tech	Serv-Other BC
All	28.1	26.3	22.7	22.9
Men	28.9	14.6	34.7	21.8
Women	27.1	39.5	9.3	24.1
MINING/CONST	15.3	6.6	61.1	17.0
MAN.-DUR	23.3	11.3	40.8	24.6
MAN.NON-DUR	18.7	13.9	27.9	39.4
TCU-WHLSL	27.8	26.0	33.7	12.5
RETAIL	8.3	50.9	8.7	32.0
PERS-SERV	21.1	16.9	19.7	42.2
PROF-SERV	49.0	26.7	9.4	14.9
PUB-ADMIN	32.8	34.8	27.9	4.6

By industries, the occupational distribution varies significantly. Professionals and managers are concentrated in professional services and public administration and are rare in retail and only slightly more prevalent in mining/construction and non-durable manufacturing.<sup>8</sup> Clerical and sales workers are a major share of the workforce in retail, public administration, professional services, and TCU-W. Since the skilled blue collar category includes technicians and protective service employees, the share of this category is large in public administration as well as the more traditional blue collar industries of manufacturing, mining/construction, and TCU-W. The service and less skilled blue collar workers plays a large role in non-durable manufacturing and personal services.<sup>9</sup>

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<sup>8</sup> The relatively high number of professionals and managers in TCU-W reflects the inclusion of sales representatives in this occupational category.

<sup>9</sup> It should be noted that these figures refer to the overall employment patterns in the industry. Because women tend to predominate in the clerical area, there are some differences within industries between the genders. For example, the share of female professionals and managers is less than the male share in manufacturing and professional and personal services. In the other industries, the respective shares are comparable and the major difference is more

To see the effect of industries on earnings, we can look at earnings of similar kinds of workers --gender and occupation-- in different industries. Since some of the average earnings differences may hide the compositional effect of using different kinds of labor, this comparison isolates out the separate industry effect.<sup>10</sup> Among managers and professionals, the distribution of earnings is higher in durable manufacturing and lower in retail and personal services for both men and women. In professional services that rely heavily on this type of labor, the distribution of earnings closely reflects the overall pattern for men and women.

For male sales and clerical workers, more are low earners in retail and personal services while there are few low earners in TCU-W and public administration. For female clerical and sales workers, the industry in which one is employed makes a big difference. Nearly three-quarters of women clerical/sales workers in retail and personal services have annual earnings below \$12,500.<sup>11</sup> By contrast, only 30 percent of female clerical/sales workers are low earners in public administration and durable manufacturing. Women clerical/sales workers do slightly better than average in professional services, non-durable manufacturing, and TCU-W.

The combined skilled blue collar category represents 35 percent of male employment but only 9 percent of women. Except for retail, there is a large presence of men in this category in all industries. Mining/construction and personal services (private guards) have a large concentration of low earners in this occupation. By contrast there are virtually no low earners in public administration among men in this category. The earnings profile in durable manufacturing and TCU-W is also characterized by few low earners but not as much as in public administration.

Service and less skilled blue collar workers tend to be low-paid with 80 percent of women and 55 percent of men in this category with annual earnings below \$12,500. Less skilled workers in manufacturing make less than other workers in this industry and still do better than comparable workers in other industries with but only one-third of these workers make less than \$12,500. Similarly, only one-half of women manufacturing fall into this low earner category. The heavy concentration of low-paid workers in this category are in retail (food service workers) and personal services. In these industries, three-quarters of men and nearly 90 percent of women were low earners.

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female clerical workers and fewer female skilled blue collar workers.

<sup>10</sup> Insert references on other similar research.

<sup>11</sup> The detailed earnings by industry of men and women are not very extensive and not presented in the text.



## The impact of industrial stability

In a previous study, the PSID was used to track 10 year career patterns based on industry, same employer, and occupation. In terms of industrial stability, three out of five prime-age men in the 1980s were persistent stayers in the same industry for at least eight years of the decade with 40 percent having less accumulated experience.<sup>12</sup> This latter group had a more diverse long-term employment pattern and spent spells of years in different industries. The earlier research also found that strong stayers averaged a third more per year over ten years than non-stayers.<sup>13</sup>

In order to see whether there are differences in this premium across industries, we need to compare the non-stayers at some point when they were in the industry to persistent stayers. For ease of presentation, a single year was picked, 1986, to compare those in the midst of an extended stay to those who were not.<sup>14</sup> For male workers aged 32 to 57 in 1986, the employment distribution among industries is a bit different from the overall male employment distribution with relatively more workers being in professional services and TCU-W offset by declines in non-durable manufacturing and retail.

As Table 4A shows, with the exception of non-durable manufacturing, stayers do significantly better than those who are not in the midst of an extended employment in the same industry. But this difference is not constant with the gap in professional services is the most dramatic in both absolute, over \$23,000 a year for ten years and relative terms (61 percent). There seems to be senior jobs in these industries that have high rewards for experienced workers. With the additional exception of mining/construction, the ten-year premium of stayers over non-stayers in the same industry is approximately 20 percent per year over the decade.

As will be shown below, industrial stability does not vary with the occupation of these young workers. Therefore, it is not true that the reason stayers do better than non-stayers is a selectivity bias towards higher-status workers. In terms of 1981 earnings, stayers tend to do better than non-stayers. But this is probably due to the fact that some stayers have already begun their extended tenure in the industry.

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<sup>12</sup> Of the remaining 40 percent, three-quarters tended to be in the same industry between five and eight years out of ten.

<sup>13</sup> Declining Job Security, p. 10.

<sup>14</sup> Different approaches were tried with basically the same results found. Clearly the stayers remain the same while the non-stayers vary from year to year. It is possible, although unlikely, that an individual employed in an industry in one year was a strong stayer in another industry for the whole decade.

Table 4A: Industry Employment patterns of male workers (32-57 in 1986 )by their 10-year employment history.

Industry	Percent Distribution	Share of strong stayers	10 yr avg earnings of stayers	10 yr avg hours of stayers	10 yr avg earnings of non-stayers	10 yr avg hours of non-stayers
Mining-Constructn	11.6	60.2	45,365	2,063	30,126	2,049
Dur. Mfg	20.9	71.9	48,554	2,156	40,710	2,073
Non-Durs.	5.2	69.1	45,366	2,249	46,047	2,264
TCU-W	16.3	55.5	46,705	2,306	38,980	2,146
Retail	10.5	54.8	41,643	2,379	34,521	2,103
Pers Servs	6.0	32.8	35,114	2,145	29,718	2,033
Prof Servs	20.5	70.0	62,841	2,228	39,097	2,100
Pub Adm	9.0	68.9	46,563	2,228	33,000	1,986

Notes: Earnings are presented in December 1995 dollars and are the average of the whole decade's experience. The 10-year average for this age group was \$43,088.

Table 4B: Women workers (32-57 in 1986) by their 10-year employment history.

Dur Mfg	7.2	50.7	24,835	1,824	17,849	1,610
Non-Durs.	7.9	45.3	20,253	1,821	14,393	1,336
TCU-W	5.9	52.3	31,174	1,778	18,231	1,430
Retail	13.8	42.2	14,451	1,684	8,482	1,105
Pers Servs	11.1	26.9	12,162	1,726	7,643	1,010
Prof Servs	47.1	68.9	25,051	1,658	11,197	1,078
Pub Adm	5.1	66.5	27,395	1,726	20,025	1,530

Notes: Earnings are presented in December 1995 dollars and are the average of the whole decade's experience. The 10-year average for this age group was \$15,180. Mining and construction are excluded because of too few women workers.



The industry variation of ten-year average earnings of long-term stayers is quite narrow--professional service workers do much better than average while personal service and retail workers do slightly below this average. This would seemingly indicate that many prime-age male workers are able to find reasonably-paying niches throughout the industrial spectrum. The industries with the highest percent of persistent stayers are durable and non-durable manufacturing, professional services, and public administration.

For women, the employment distribution, level of annual earnings, and share of strong industrial staying were very different. First, 21 percent of women (versus 9 percent of young men) were out of the labor force in 1986. Of those that were employed at the beginning of the period, 55 percent were strong industrial stayers. Second, the distribution of women among the eight industrial divisions is much more concentrated in a single category--47 percent in professional services with over two out of three women in this industry being persistent stayers. Third, much of the effect of being an industrial stayer was mediated through hours worked: non-stayers tended to work much less on average than stayers. So, a major reason for lack of industrial stability was women's family responsibilities requiring them to spend periodic time outside the paid labor force. Of those that do stay in the labor force, a very high percent do remain in the same industry year in and year out, particularly in the broad category of professional services.

In terms of effective wage rates, the differential between stayers and non-stayers was often small and non-significant in non-durable manufacturing, retail, and personal services. This means that there was very little wage rate return to longevity in these industries with this group of middle-age women seeming be stuck in "dead-end, low-paying" jobs. In the other industries, the wage rate premium was of the same order of magnitude as the difference between male stayers and non-stayers. The earnings premium for these persistent stable women was much higher because of the added effect of greater hours worked.

The next table tracks the experiences of young workers in 1981 forward for the next ten years in order to see if they stayed where they started. For men, 51.5 percent stayed in the same industry that they began the decade in. Not surprisingly, certain industries tended to maintain their workforce over time: three out of five durable manufacturing, professional services, and public administration workers were strong stayers, but only one of five stayed consistently in personal services, and two out of five in retail and non-durable manufacturing.

With one exception, strong young male industry stayers had higher ten-year annual earnings than non-stayers. The gap varied substantially among industries and was largest in durable manufacturing, TCU-W, professional services, and public administration. For non-durable manufacturing, construction/mining, and retail the premium was only about ten per cent. For young male workers who began in personal services, strong stayers were rare and did worse than leavers. But, under all circumstances, those young male workers who started employed here earned significantly less than any other group.

Table 5A: Industry Employment patterns of young male workers (21-31 in 1981 )by their 10-year employment history.

Industry	Percent Distribution	Share of strong stayers	10 yr avg earnings of stayers	10 yr avg hours of stayers	10 yr avg earnings of non-stayers	10 yr avg hours of non-stayers
Mining-Constructn	11.9	53.7	33,104	2,140	29,997	1,979
Dur. Mfg	21.4	59.3	43,248	2,142	29,464	1,897
Non-Durs.	8.6	43.5	36,074	2,119	33,253	2,000
TCU-W	13.6	55.2	43,155	2,255	30,270	2,195
Retail	14.5	44.4	38,394	2,395	32,236	2,159
Pers Servs	5.9	18.5	22,003	2,439	26,931	2,109
Prof Servs	15.7	59.7	61,586	2,127	35,361	2,133
Pub Adm	8.6	62.6	41,830	2,278	31,830	1,930

Notes: Earnings are presented in December 1995 dollars and are the average of the whole decade's experience. The 10-year average for this age group was \$36,626.

Table 5B: Young women workers (21-31 in 1981) by their 10-year employment history.

Dur Mfg	10.0	33.6	24,808	18,650	1,919	1,563
Non-Durs.	8.6	27.7	18,628	1,876	15,322	1,247
TCU-W	5.6	62.3	31,527	1,790	14,998	1,340
Retail	13.2	35.1	15,895	1,685	11,136	1,253
Pers Servs	8.5	25.4	9,190	1,583	14,515	1,413
Prof Servs	47.6	63.7	25,471	1,727	12,922	1,242
Pub Adm	5.5	54.9	28,599	1,748	22,065	1,547

Notes: Earnings are presented in December 1995 dollars and are the average of the whole decade's experience. The 10-year average for this age group was \$15,139. Mining and construction are excluded because of too few women workers.

The pattern for young women was very similar to that of older women. In these prime child-rearing years, 35 percent were out of the labor force in 1980 (the comparable figure for young men was 11 percent). Of those that were employed, one-half were strong stayers in the industry they started in and almost one-half started in professional services. The hours effect for young women was even stronger than it was for older women. Surprisingly, the wage rate effect was even smaller than before and was only significant in TCU-W and professional services. For those who started in personal services, leaving the industry allowed them to have higher wage rates. The gap was so large that the average annual earnings of leavers was over 50 greater than stayers even though they tended to work fewer hours per year.

Now we can turn to occupation by industry and determine whether there are separate effects in different occupations. As Table 6 shows, except for service-less skilled blue collar occupations, industrial stability is approximately equal for the other occupational groups for men. For women, it is professionals and managers who have distinctly higher rates of stability than the other three categories. Since women's stability levels seemed to be driven by staying consistently employed, this finding indicates that professional/managerial women do not exit the labor force as much.<sup>15</sup>

Table 6: Percent of strong industrial stability by occupation, 1986 of 32 to 57 year olds.

	Prof-Manager	Clerical-Sales	Sk. B.C.-Tech	Service-Other B.C.
Men	64.1	67.3	64.8	53.5
Women	71.6	48.8	50.7	52.0

Table 7 investigates whether the returns to staying in an industry vary across industries. The specified occupations within each industry only include categories for which there are a sizable number of cases. For male professionals and managers, the premium for being a persistent industrial stayer is very high in the white collar fields of professional services and public administration. However, in the other industries (where the share of managers is highest), the earnings differential between stayers and non-stayers is small. Male clerical and sales workers are concentrated in only a few industries, and again there is a large payoff for staying in professional services and public administration.

In terms of male blue collar and service workers, industrial stability is very important

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<sup>15</sup> This may be driven by economic factors--professional and managerial women tend to earn more and tend to be married to high-earning professional men. As a result, they can more easily afford outside child care, freeing the woman to continuously pursue her career.

with the exceptions of non-durable manufacturing and personal services. In the latter two industries, the pay for men is relatively low and men who stay in these industries are actually at a disadvantage to those who find employment elsewhere. But in the heavily blue collar industries of mining, construction, durable manufacturing, and TCU-W, industrial stability leads to much higher earnings.<sup>16</sup>

Table 7: Occupational differences of within Industry stability, 1986 for

	Male premium of industrial stayers over non-stayers.	Female premium of industrial stayers over non-stayers.
Mining-Constructn	Sk B.C. 13 Serv-Other BC 33	Few women employed here.
Dur. Mfg	Prof/Mng 2 Sk B.C 57 Serv-Other BC 196	Clerical/Sales 32 Serv-Other BC 47
Non-Durs.	Prof/Mng 11 Sk B.C 41 Serv-Other BC -12	Clerical/Sales 0 Serv-Other BC 47
TCU-W	Prof/Mng 0 Sk B.C. 31 Serv-Other BC 43	Prof/Mng 93 Cler/Sales 35
Retail	Prof/Mng 19 Cler/sales 0 Serv-Other BC 120	Prof/Mng 70 Cler/Sales 79
Pers Servs	Prof/Mng 28 Serv-Other BC -18	Prof/Mng 150 Cler/Sales -10 Serv-other BC 7
Prof Servs	Prof/Mng 56 Cler/Sales 40	Prof/Mng 70 Cler/Sales 96
Pub Adm	Prof/Mng 30 Cler/Sales 40	Prof/Mng 0 Cler/Sales 69

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<sup>16</sup> The number of cases in each of these cells is relatively low, which can lead to wide swings in the results.



## Industry Staffing Patterns

Now we can combine the PSID information with the CPS data to see how different industries use long-term and short-term employees. The first five columns of Table 8 represent different age and gender groups of the work force. Prime-age men 32 to 61 who are persistent stayers average 2,200 hours of paid work. Non-staying prime-age men and staying young men (22 to 31 years old) average 2,000 hours a year. Women stayers, by contrast, average less than 1,700 hours in the paid labor force, while the grouping of non-staying women, and young and old workers average less than 1,000 in the paid labor force.<sup>17</sup>

The last group clearly has the least immediate attachment to the labor force and represents over one-third of those with some labor force experience in 1989. This group changes from year to year as some women move in and out of the labor force to take care of family responsibilities. If we include prime-age women who are currently out of the labor force but who have work at least some of the time over a five-year time span, then the size of those with weak labor force attachments would rise to 40 percent of the "potential" labor force in a given year.

The division among the five category of workers varies substantially among the industry groupings. Over one-half of the workers in retail and personal services consist of those workers with the least labor force attachment. Non-durable manufacturers also heavily rely on these less-permanent workers.

The conditions in professional services are a bit deceiving. On the one hand, there are many highly-paid workers with longevity in the industry. But because it has a lot of clerical workers, there is a relatively high concentration of women without strong persistence in the industry. The men in this industry tend to stay and be highly-paid but there are relatively few of them. In the related industry of public administration, there are relatively more men and very few low earners, with almost half the workforce earning between \$25-50,000. For women, these two industry groups provide the most opportunity for high pay and longevity.

Durable manufacturing and TCU-W tend to have blue-collar, male workforces. The workers tend to stay in the industry and there is a relatively high concentration of those earning over \$25,000 a year. Mining and construction, however, is also male and blue collar, but has a much younger workforce. It appears that many workers rotate out of these physically taxing industries as they age to find comparable employment in other industries.

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<sup>17</sup> For women, younger and prime-age women have very similar earnings and employment histories. Therefore, for ease of presentation, all adult women are combined into a single category.



Table 8: Division of Labor Force and Industrial Employment by Stability level, 1989

	Men 32-61, Stayers	Men 22-31, Stayers	Men 22-61, non-Stayers	Women 22-61, Stayers	Non-staying Women, youth, + elderly	Percent Earning greater than \$50,000	Percent Earning \$25,000-\$50,000
All	18.4	7.6	17.6	20.6	35.6	6.2	24.0
MINING CONST	29.0	15.3	32.4	6.4	16.9	6.2	25.3
MAN-DUR	32.3	11.5	20.3	11.7	24.1	10.2	36.7
MAN.NON-DUR	22.0	6.3	16.2	16.1	39.3	5.4	22.7
TCU-W	24.3	10.4	28.1	14.2	22.9	9.0	36.0
RETAIL	9.8	5.5	14.7	14.0	56.1	2.1	10.2
PERS-SEV	6.8	2.9	25.9	10.7	54.1	2.5	10.1
PROF-SERV	14.8	5.3	9.6	38.0	32.3	7.5	24.0
PUB-ADMIN	27.0	8.5	18.0	23.6	23.0	7.1	46.5

## Conclusion

Different industries have developed dependent on the labor force available to them and the technical requirements of production, *i.e.*, how much time, physical effort, and skill it takes to master the process. There has been a substantial increase in the number of women in the workforce even though they still tend to work full-time, full-year schedules less consistently. In the 1980s, 33 percent of prime-age women and 86 percent of prime age men averaged over 1,750 working hours per year over the entire decade. With less effective experience coupled with occupational segregation, prime-age women averaged as a group only 37 percent of what prime-age men made over the entire decade of the 1980s.<sup>18</sup> In a single year's context, this difference is evident in the share of workers of all ages earning over \$50,000 in 1989--6.6 percent of men and 0.9 percent of women.

For women workers, industrial staying seems to be the norm and that women become persistent stayers by the criteria used here by staying in the paid labor force consistently. As

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<sup>18</sup> On Shaky Grounds, p. 18.

was noted above, in most cases, the earnings difference between stayers and non-stayers was driven almost entirely by hours worked. One of the prominent exceptions was young women in personal services. Here workers who stayed in the industry continued to earn very low wages while non-stayers were able to find better employment in other industries.

However, the primary mover of women's labor market experience occurs in professional services and public administration. In addition to the large number of clerical workers, there are many women professionals and managers. In these fields, industrial staying leads to more hours but also higher wages per hour. This seems to be the place where most women with successful careers are.

As traditional bread winners, men tend to work full-time, full-year schedules whether they are stayers or not. As was shown in table 4A, staying pays off in most cases, especially among professional services employees. Personal service industries with only five percent of prime-age men are the only sector that could be classified as having dead-end jobs: both stayers and leavers have low average ten-year earnings with non-stayers having slightly higher earnings. Even in retail, there seem to be opportunities for experienced male employees. Finally, mining and construction are industries with very few professional and managerial employees and therefore low average earnings.

As Table 8 shows, industries differ in how they utilize different kinds of labor. There has been a large debate about the effect of declining good job opportunities in manufacturing. On the opposite side, the rise of service sector employment has been portrayed as having limited career opportunities. Much of this debate has been conducted by looking at gross employment and not looking at career patterns and the employment of prime-age workers. More light may be shed on these questions when we finish the comparable analysis for 1979 based on the employment histories of the decade of the 1970s.

Appendix Table 1: Definition of Research categories

Industrial Divisions:	
Mining and Construction	
Durable Manufacturing	Includes Oil, Chemical, Printing, and Rubber Industries
Non-Durable Man.	With the exceptions cited above
Wholesale, Transport'n, Counmunicat'n, Utilities	
Retail Trade	
Personal Services	Excludes consulting and computer services
Professional Services	Includes consulting and computer services, Finance, Insurance, Real Estate, Education and Health Services.
Public Administration	Only those Activities that are administrative in nature
Occupations:	
Managers and Professionals	Includes sales representatives, stock brokers, and real estate agents.
Clerical and Sales	With the exceptions cited above.
Skilled Blue Collar and Technical Workers	Includes protective service workers.
Unskilled Blue Collar and Service Workers	With the exceptions cited above.

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**Changes in Working Time in Canada and the United States.  
June 13-15, 1996  
Ottawa, Canada**

## **Session 3A (i)**

**The Impact of Large Companies' Increased Use  
of Temporary Workers on Financial Measures of  
Performance**

Shulamit Kahn  
Boston University

Preliminary: Not to be quoted or cited without prior permission of the author(s).

Conference presented by:  
**The Canadian Employment Research Forum (CERF)**  
in cooperation with:  
**Human Resources Development Canada,  
Statistics Canada, and the  
W.E. Upjohn Institute for Employment Research.**





**Changes in Large Companies' Use of Temporary Workers and Their Impacts on  
Financial Measures of Performance**

Shulamit Kahn, Jeffrey Heisler and Fred Foulkes

Boston University School of Management

June 1996

Paper to be presented at the conference "Changes in Working Time in Canada and the United States" sponsored by the Canadian Employment Research Forum and the Upjohn Institute for Employment Research.



## I. Introduction

Over the past decade, there has been a large increase in the number of people employed in temporary work. For instance, in December of 1995, the number of employees in the SIC industry code help supply services (7363) was estimated in the CPS as 2.14 million people (Monthly Labor Review). an increase from 0.6% of the labor force in 1985 to 1.6% in 1995.<sup>1</sup> In the early 90's, many analysts believed that this was a phenomenon born of the last recession that would reverse itself in the subsequent expansion. Instead, the trends continued through the middle of 1994. Since that date, the growth rate has slowed considerably, although the Bureau of Labor Statistics projects that the somewhat larger category of "personnel supply" will be the seventh fastest growing industry between 1994 and 2005, with growth projected at 58% (Staffing Industry Report, January 15, 1996.)

This study considers large companies' changing uses of temporaries and their reasons for using more temps, based on a random survey of human resource executives from large companies around the country. It then correlates these companies' changing uses of temporaries with financial measures of profitability. The sample is quite small, so it is more suggestive than definitive. Remarkably, some statistically significant correlations do arise even within this small sample. Although it is impossible to deduce causality from correlation, the results are somewhat suggestive that strategic uses of temporaries may increase operating margins and company value.

The study also considers a case study of two firms in a narrowly defined manufacturing industry. These firms radically increased their use of temporaries, hiring all entry-level production workers as temporaries who then (if successful) transition into permanent employment after three months. Financial measures of performance after the policy change indicate that the companies either did equally well or worse than the previous

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<sup>1</sup>Alternatively, a February 1995 supplement to the CPS estimated that 1.0 percent of employed workers were paid by temporary help agencies while an additional 1.7% of the employed were on-call workers and day laborers, for a total of 2.7% of the workforce in temporary work.

period, suggesting that this use of temporaries was either neutral or harmful to companies' bottom lines.

## II. Description of Survey

The focus of this group is large companies' usage of temporary employees. In the first phase of our research, we conducted in depth, open-ended interviews with human resource executives from several large companies to get a sense of the role of temporary staff within their organizations. We also spoke to a large number of executives from within the staffing industry to get their perspectives and insights into industry trends.

Although chosen primarily for their accessibility rather than for aspects of their temporary usage, these preliminary interviews were *not* in any way a representative, random sample. To obtain a representative sample of large companies, we chose companies randomly from the Fortune 500 Industrials and other Fortune lists (Banking, Savings, Financial, Retail, Service, Transportation, Utilities) and identified a senior human resource executive in that company, generally the Human Resource Vice President. Through a letter, we solicited these companies' participation in an extended telephone interview and asked for a contact within the company most familiar with the company's use of temporaries. We followed up this letter with telephone calls. We conducted 35 interviews from this sample, each lasting an average of around 30 minutes. This represents a response rate of 22%. Of the non-respondents, 29 refused in writing or over the phone to participate in the research, generally because of time constraints or company policy not to participate in surveys.<sup>2</sup> In the other cases, we failed to reach the appropriate person after several phone calls. Given the high level of the executives whom we were contacting, a low response rate is expected. A crucial question is whether there is any bias in the responses. The most likely bias would be that companies doing innovative things concerning temporaries are more likely to respond. While this is a possibility, the factors arguing against this bias are the nature of the reasons

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<sup>2</sup>One executive was able to schedule an appointment 6 months hence but no sooner.

given for non-response (full schedules, company policy towards surveys) and the fact that the most common case of non-response was simply failure to make any contact with the relevant person.

The actual respondent from each company was a person familiar with the company's use of temporaries. When the company's use of temporaries was decentralized, we tended to be put in contact with someone who was familiar with only a portion of the company's temporaries, generally those used at corporate headquarters. Respondents ranged from Senior Vice Presidents to Employment Specialists. In the completed telephone interviews, we followed a seven page script/questionnaire that included many open ended questions as well as more specific ones.<sup>3</sup> The small size of this sample means that any hypothesis test is likely to be rejected unless differences are quite large.

Among the companies surveyed was one in the South's fibers/textiles industry that we discovered had made a sudden shift towards the exclusive use of temporaries for all entry level production jobs. In order to conduct a time-series event study of this firm, we conducted a telephone survey of seven other comparable firms, i.e. non-unionized, Southern publicly-owned companies in the fiber/textiles industry. This additional sample was taken from the Compustat listing of companies in three similar four-digit industry codes. We identified 12 companies (other than our original one) which had headquarters in Southern states. Of these, we were able to interview seven.

### **III. Results: Changes in the Role of Temporaries**

Labor force surveys indicate an increase in the number of temporaries in the U.S. This increase is evident in our sample of large firms as well. Along with the changing numbers of temps, there were also changes in other aspects of temp usage. As the first row of Table 1 indicates, the increased usage of temporaries was by no means universal. The

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<sup>3</sup>Because of confidentiality agreements, we are not using company names in this paper. When company names appear, the information is not from our sample itself but from other sources.



proportion of firms who substantially increased their use of temps (37%) is just equal to the proportion with a small or no change. While each of these categories are larger than the proportion who decreased their use of temps, fully a quarter of the firms in the sample did substantially *decrease* their use of temps.

At the extreme, some companies have moved to hiring **only**, or primarily, temporaries for large numbers of jobs within their companies. We have observed two variants of this policy. In one, temporaries are told the maximum length of time that their job will continue. In the second variant, temporaries who perform well transfer over to regular jobs after some period, often specified up front. Reading the business press and talking to HR executives, we identified quite a few companies who are hiring only temporaries for large classes of jobs. These include Dell Computers, Hewlett Packard, DEC, and Valujet. At Dell, approximately 3,000 of the company's 10,000 employees are temporary. At HP and DEC, 30% to 35% of their manufacturing jobs are being done by temporary employees. Many of these examples are at newer, rapidly growing and changing organizations. What is particularly surprising, however, is that even in sample of 35 randomly chosen companies, we found two companies who each are hiring only temporaries into a large class of entry-level jobs.

The changing role of temps is evidenced not only in their numbers, but also in their roles. Other surveys have documented shifts in the occupational distribution of temporaries. The typical image of a temporary as a "Kelly Girl", a female secretary, characterized a majority of temporaries twenty years ago but no longer does. By 1994, only 40% of the payroll for temporary help services went to office/clerical occupations (NATSS). In our sample, we found that while almost all companies used temps for secretarial/clerical positions, 80% also used temporaries for other kinds of jobs. One source of growth highlighted in surveys such as NATSS' is in the "light industrial" category, including production work and unskilled manual labor. 40% of the companies in our survey use temps for these occupations. In fact, Blank(1995) found that the temporary help industry has approximately the same proportion number of people in blue collar occupations as does the

general labor force. Given the fact that blue collar temporaries tend to be unskilled, we can infer that a much higher proportion of temps are in unskilled blue collar jobs than in the general labor force.

Table 1 also shows the number of companies who changed their use of temps in other ways. 94% of our sample changed their use of temporaries in one of the six ways listed in Table 1 (either substantially changing the percentage of temporaries that they hire, the occupations they hire into, the kinds of sources they use to obtain temporaries, the situations in which they bring in a temporary, the length of time temporaries stay or the likelihood of permanently hiring a temporary). 40% changed more than three of these six aspects of temporary use.

44% of the companies indicated that they are using temporaries in different kinds of situations than they had previously. Table 2 lists the kinds of situations that these companies report that they use temporaries. The situation that best fits the traditional view of a temporary is someone hired as a replacement for temporary absences. Most companies continue to use temps for this purpose. Several employers reported expansion of this need due to changing medical and family leave policies.

The business press has adjured companies to use temps as part of a "strategic staffing" plan (e.g. Denka 1994). In essence, a strategic staffing plan is one where employment policies are seen as a part of a company's strategic plan and where alternatives to full time regular staffing are actively considered at a general level rather than as ad hoc or reactive decisions. The list of situations in which large companies use temporaries in our sample suggest that companies are in fact using "strategic staffing", or at least claiming to. Practically all (91%) are using temporaries not just for temporary replacement of absences but also as a deliberately chosen alternative to permanent employment designed to further firms' profitability. Other than absence replacement, the other reasons listed in Table 2 suggest that temporary labor is seen as a solution to two kinds of variance in labor demand: (1) foreseen variance and (2) unforeseen and uncertain variance.

One major source of foreseen variance is temporary or special projects. The largest

use of temporaries reported in the survey is to staff temporary projects, where "temporary" projects can last as long as two years or more. Temporary projects include start-ups, e.g. for new stores or new computer systems. Rather than hiring a regular employee and, upon completion of the project, either finding them alternative positions or paying them a severance package, companies are turning to temporary employees who do not impose the same future responsibilities.

Many companies whose labor demand fluctuates considerably over the year are decreasing labor costs by using temporaries seasonally. For instance, temporaries are being used to harvest fruit in Florida and to process the February rush of annual proxy statements for a large investment bank. One HR manager explained, "We don't staff for peaks any longer." Half of the sample use temporaries for seasonal fluctuations. Both the seasonal needs and temporary projects introduce fully anticipated variance into labor demand. Temps are a logical solution.

When companies face uncertainties about future employment needs, they also sometimes use temporaries to address these uncertainties. 20% of our sample use temporaries when they are uncertain whether new products will take off or what their need will be for a new endeavor. For 22% of the companies, temps are being using to provide a buffer to protect the jobs of core, regular employees. Thus, temporaries are being used as a solution to unforeseen shifts in product demand.

To an economist, these uses of temporaries do not seem surprising. In fact, it seems more surprising that temporaries were not always used to solve problems of variance and uncertainty.

### **Temporary Assignments as a Recruiting and Hiring Mechanism**

A final major motivation for the use of temps, not related to variable or uncertain labor demand, is the avoidance of many of the costs of poor job matches. In all jobs, both the employer and the new employee take time to learn about whether this job is a good match. Unsuccessful matches tend to be terminated by one party or the other. There are



many costs of mismatches that fall on the employer, the employee and society. Some of these costs can be avoided by having new entrants begin in the company as an employee of a temporary agency. First, risk to the employee is lower. If this job does not work out, the employee is given another placement by the temporary agency.<sup>4</sup> For the employer, severance pay, long dismissal procedures and increased unemployment compensation premia are avoided. Moreover, managers don't have to be put in the difficult emotional position of firing someone, or of being responsible for someone's loss of livelihood. Recruiting costs, e.g. of attracting candidates or doing drug and criminal screens, are not lost when a particular match does not work out. Societally, unemployment compensation is not incurred when the temporary is reassigned. Finally, in some of the companies we interviewed, it was clear that often temporary agencies had "economies of scale" in recruiting and could simply attract and process candidates more efficiently than some companies. On the other hand, the use of temporaries as a hiring mechanism may be a way for companies to change the implicit or explicit employment contracts with potential employees or to evade government policies.<sup>5</sup>

In our sample, 94% of companies responded that they have permanently hired people who began as temporaries. The survey also provides some evidence of increasing use of temps as a hiring mechanism. 31% of companies reported that their permanent hiring of temporaries has increased over the past five years. Not a single company responded that their permanent hiring of temporaries has decreased.

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<sup>4</sup>Owners of temporary agencies have told me that while they do not ignore the employee's unsuccessful experience, neither does a single unsuccessful match lead an agency to drop an employee from its roster.

<sup>5</sup>Thus, rather than using temporaries to avoid severance pay or to avoid paying benefits, companies could change their own policies for the probationary period. Seen this way, the movement toward temps-as-probationary-workers may simply be an expedient way for companies to in effect renegotiate the contracts of new employees. Moreover, the use of temporaries in this way may allow companies to avoid government policies such as unemployment compensation experience-rating or the threat of suit for discriminatory practices if dismissed during the probationary period. The case law regarding co-employment of temporary workers is still evolving.

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This increased hiring is also being documented by temporary agencies. Manpower reports that in 1993, they themselves transitioned 150,000 temps into regular jobs. One mid-sized temporary agency with whom we talked has done an informal poll and found that between 30% and 35% of their assignments could change to permanent. In a 1993 NATSS survey, more than one third of temporary employees reported being offered a regular job by a firm for whom they had an assignment. In a more recent NATSS survey of former temporaries, 21% had found permanent jobs as a result of their temporary position<sup>6</sup>.

Permanent hiring of temporaries occurs in two conceptually different ways which have been given different names within the temporary staffing industry, temp-to-hire and temp-to-perm. In the former, the hiring is an unforeseen and unplanned consequence: supervisors like their temps, or temps get inside tracks to a job or to jobs listed within the company. This hiring of temporary employees generally tends to be a small but not inconsequential part of a company's total hiring. Of companies who did not do temp-to-perm, on average only 24% of new employees in the jobs comparable to ones held by temps began as temps.

In temp-to-perm, companies hire temporaries with the intention of transitioning them into regular employment if the match is successful. In these companies, on average more than half of people hired into these specific job categories began as temps. As one sample respondent put it, "Now, even low level supervisors know this is another way to recruit, one of their bag of tricks. In the past, it was not a concept they knew of or thought of."

Temp-to-perm will be a profit-maximizing strategy when temporary agencies are able to attract an ample supply of qualified candidates and when an extended trial period is a particularly helpful way to screen candidates. Not surprisingly, then, in our interviews with companies, we saw temp-to-perm most commonly used for "light industrial" i.e. relatively unskilled blue collar jobs -- where work habits tend to be of prime importance in determining

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<sup>6</sup>Reported in Staffing Industry Report, January 1996



the success of an employee -- and in white collar jobs that are based on speed and accuracy such as billing and telephone operators. For one company, the supply of light-industrial employees available through temporary companies was greater than the company itself could otherwise recruit.<sup>7</sup>

The screening aspect of this process is quite clear from the interviews. Only workers who "work out" become regular employees. If temporaries can provide a way of screening employees that incurs less mobility costs, it seems clearly Pareto superior. Once again, economists are more challenged to explain why these methods were not used previously, rather than to explain why they are being used now.

### Temporaries and Downsizing

The survey provides some evidence that decreased firm demand for labor, either due to slow sales or to cost-cutting in the face of increased competition, is correlated with an increased use of temporaries. A test of the correlation between downsizing and changes in their proportional use of temps is significant at the 20% level. Of the 53% of companies in our sample who reported some downsizing in the past five years, fully 78% *changed* their proportional use of temporaries while only 50% of companies who did not downsize changed their usage. A recent survey by Olsten (cited in Business Wire, 1996) found that slightly more than half of firms who report downsizing say that they use temps to address staffing issues.

However, different companies make very different kinds of decisions about temporaries while downsizing. Downsizing companies are *both* more likely than others to increase and to decrease their use of temporaries than companies who did not downsize. Of downsizing firms, 50% increased their use of temps while 28% decreased them. Among the

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<sup>7</sup>This occurred in the textile/fiber company that is the focus of our case study later in this paper (Firm A).

other companies, 31 % increased their use of temps while 19% decreased them.<sup>8</sup>

The small sample who report downsizing does not lend itself to statistical analysis. If we consider these sixteen companies as case studies, we come up with suggestions of the kinds of factors that have led at least some companies to modify their temporary usage during periods of contraction.

If temps are used to protect full time employees from layoffs, we would expect that the number of temps fall drastically during downsizing. While this occurred in some companies, in our small sample the numbers above indicate that decreased use of temps was less common than increased use.

One factor that was repeatedly mentioned for increased use of temps was the presence of headcount restrictions -- limits imposed on line managers for the number of people allowed on payroll. Headcount restrictions are a common mechanism used by central management to control costs incurred by line managers. Headcount has the advantage of being an easily measurable cost item that is not affected by conditions outside the line manager's control, such as fluctuating market wage rates or materials prices. However, as companies move to greater usage of temporaries and part-time workers, headcount restrictions should adjust to reflect these new institutions. While it is still profit-maximizing for companies wishing to limit to their permanent employment, for reasons like flexibility, to impose headcount restrictions on permanent employees, additional restrictions on temporaries must be imposed to eliminate temporaries as a way of avoiding headcount restrictions.

In some companies we interviewed, headcount restrictions included temps. In others, the restrictions applied only to permanent employees and managers used temps to evade these restrictions. In fact, a majority of the companies that we interviewed (53%) said that avoiding headcount restrictions (presumable of permanent employees) was a factor in its use of temps. Of the nine companies who chose to increase their (proportional) usage of

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<sup>8</sup>A chi-squared test of downsizing versus increasing, decreasing or keeping temps steady is significant at the 24% level.

temporaries during a contraction of employment, six attributed the growth in their use of temporaries at least partially to headcount restrictions. An HR manager in one company, for instance, reported that a hiring freeze has led line managers to hire a temp when an extra person was needed. In another company, the interviewed HR executive told how line managers had to "play games with headcount when, headcount considerations aside, regular hiring would have made much more sense". However, headcount restrictions on permanent employees may be optimal in the company which wanted "to keep their future long run commitment to new employees low".

### Hourly Labor Costs and the Increasing Use of Temps

The previous sections suggest that temporaries are increasingly being used to promote efficiency in a variety of ways and thus raise profitability. An additional way that temporaries might impact profitability is through direct hourly costs. Temporaries receive lower benefits than their "permanent" counterparts. In our sample, all but two companies say that benefit levels for temps are much lower or lower than for regular employees, with the vast majority placing them much lower or nonexistent.<sup>9</sup> Others have also documented the low benefit coverage for temporary workers, including BLS 1995 and Axel 1995. The hourly rates *paid to the temporaries* are sometimes lower than the regular people they replace but sometimes higher, both in our survey and in comprehensive labor force surveys such as the CPS data analyzed in Segal and Sullivan, 1995. However, companies pay a large margin to cover temporary agencies' costs. Totaling the savings in benefits, different hourly rates and agencies' margins, do companies save on hourly compensation costs when they use temporaries? 63% of companies believe that they do, with half of the others believing that there is no saving and the other believing that temps cost more than regular employees.

However, even for many of the companies who save on compensation costs,

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<sup>9</sup>One of these two companies has a pool of in-house temps that tend de facto to be continually employed.

respondents volunteer the information that costs do not enter into their decisions to use temporaries. One executive seemed quizzical when I asked him about direct cost savings and said "We don't look at it that way."

### **Does Productivity and Product Quality Suffer?**

Hour for hour, do temporaries work as efficiently as permanent workers and produce similar quality products, ignoring slack periods where permanent workers may be under-utilized? Only extensive case studies can really answer this question. Companies differed on their perceptions of the overall productivity of temporaries. 17% of the companies listed the temporary's lack of commitment among the three biggest problems temporary employees cause them. One respondent noted a perception among his supervisors that temporary employees were not as qualified, but wondered whether this was due to the fact that the supervisor did not feel "ownership" of these employees.

Yet many employers mentioned the increasing skill and quality levels of temporaries. In fact, several employers believe that temporaries often worked harder than regular employees because they hoped thereby to obtain a permanent placement. Both our survey and a recent Conference Board survey (Axel, 1995) found that the most frequently mentioned difficulty with temporary workers was that they lacked the skills and training to do the job. In our survey, 23% of employers mentioned this response.

These mixed perceptions suggest a high variation among temporaries, with average quality varying from company to company as well as from market to market, depending on supply/demand conditions in the specific occupational labor-market as well as on the skill of the temporary agency in screening applicants.

### **Have Things Really Changed?**

It is instructive to compare our survey and others recently conducted with the survey conducted in 1986 by Katharine Abraham and the Bureau of National Affairs (Abraham, 1988). That survey of HR executives also identified special projects, seasonal needs and



providing a buffer for regular staff against downturns in demand, long before HR executives were using the term "strategic staffing" for decisions regarding temporaries. The proportion using temporaries for at least one of those purposes was lower in that earlier survey although only marginally so.

The 1986 survey found that 23% of companies said that one reason they use temps was to "identify good candidates for regular jobs", similar to the proportion in our sample who use temp-to-perm or the proportion in the recent Conference Board survey (Axel, 1995) who respond that they use temps to screen candidates for future employment.

These results suggest little change between 1986 and 1995, despite claims of the survey's HR executives to the contrary. However, other aspects of temporary usage *have* changed. There has been an increase in temporaries as a proportion of the companies' total employment. The mean of this proportion in the 1986 sample was 1.5%, while the mean in the present sample is 2.3%. A much larger difference is evident at the extreme: 2% of the companies in the 1986 survey reported using 10% temps or more while in our sample, 9% of companies used 10% or more.

The second major change seen is the length of stay of temporaries. In the 1986 survey, only 7% of the companies reported that the mean duration of the typical assignment was 3 months or greater. In our survey, 40% reported typical lengths in this range, while in a recent NATSS survey, they found that 56% of temporary assignments last 11 weeks or more.

Finally, we note that although the same number of companies report that they use temps to identify good candidates for regular jobs or for purposes like special projects or seasonal fluctuations, this does not preclude the possibility of major changes in the ways companies conceive and decide both the temp-to-perm and "strategic staffing" uses of temps. Moreover, the increase in the number and use-intensity of temps suggest that although the number of companies using temps for these purposes may not have changed, the extent that they use temps in these ways undoubtedly has.



#### IV. Results: The Use of Temporaries and Financial Measures of Performance

If temporaries improve a firm's performance, we should see this reflected in the company's profits or other financial measures. This impact could, at least hypothetically, be measured by a cross-sectional comparison of companies who differ in their use of temporaries. Alternatively, it could be measured by comparing the financial performance for companies (or industries) before and after a change in their use of temporaries. In this section, we pursue both methods.

The cross-sectional analysis will be plagued by two different kinds of conceptual problems, causality and heterogeneity issues. A positive correlation between the use of temporaries and financial success might indicate that the use of temporaries increases a company's profitability. However, it could instead indicate that companies who are likely to be profitable (e.g., dynamic, growing companies) choose or need to turn to temporaries for some of their staffing needs.

The great degree of heterogeneity of companies on a wide variety of other dimensions is likely to make this exercise akin to searching for a needle in a haystack. Research has shown that it is extremely difficult to detect financial impacts of changes in human resource practices.<sup>10</sup> Additionally, as temporaries are used in many different ways and situations, there is not likely to be a similar impact of temp usage in various contexts.

A time series analyses of companies can avoid some aspects of these problems. First, by comparing periods before and after a change in policy, we can mitigate the causality issue. Second, by looking at individual companies (relative to industry trends) we can remove some of the heterogeneity. Pursuing the analogy, the time series analysis is akin to finding a button in a haystack: there are still many confounding issues, but we've slightly increased the likelihood of finding some impact.

We have chosen to look at three measures of financial performance: Market price per

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<sup>10</sup>When HR policies have been shown to have impacts, it is usually when many aspects of management change simultaneously. Similarly, we would be most likely to find an impact when the firm is simultaneously adopting an entire "strategic staffing" approach.

share (P) summarizes all publicly information and expectations for the company. However, the share price will reflect all of the activities of the firm, such as acquisitions, making it an extremely noisy series for measuring the impact of temporary policy. We also examine variables that attempt to measure the on-going profitability of the enterprise: earnings and operating margin (OPM). Earnings is measured as primary earnings per share (EPS) before extraordinary items, i.e., one-time events such as acquisitions and divestitures. OPM is the ratio between operating income and sales. This ratio measures the impact of cost of goods sold (COGS) and sales, general and administrative expenses (SGA) which include labor costs, on the company's profitability. Although neither of these measures are affected by events like acquisitions, they are affected by changes in accounting practices.

### Cross-Sectional Analysis

For the 35 different companies in our sample, we correlated a variety of aspects of temporary usage with the financial variables, the latter considered both in levels and in five year (89-94) changes.<sup>11</sup> The results can be summarized succinctly:

- (1) A 7-value index of changing usage of temps, from large cuts in the use of temps to large increases, is generally unrelated to all financial variables with the following exception: companies who had a high earnings per share<sup>12</sup> at the beginning of the five-year period were significantly more likely to increase their temporary usage. ( $P=.02$ ). A two-value index of whether a company substantially increased its use of temps was also correlated with increasing share prices ( $P=.10$ ).
- (2) The correlation between temps as a proportion of total employment and the change in share price over the five year period was positive and highly significant ( $P=.01$ ); the proportion temps was also positively related to the change in EPS over the period at a

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<sup>11</sup>The surveys in the cross-section were all carried out in 1995, and asked about changes in the previous three to five years.

<sup>12</sup>All earnings per share numbers are standardized by the share price.

- lower significance level ( $P=.17$ ). However, it was not correlated with levels of either EPS or OPM, nor with the change in OPM.
- (3) In order to make an index for increased use of temporaries as a strategic staffing plan, we counted the number of "strategic" changes the company made including: increasing use of temporaries, changing sources of temporaries, changing situations in which use temporaries, increasing the length of temporaries' stays, increasing hiring of temporaries as permanent employees, and changing the occupations that they hire temporaries in. This "strategic temp changes" variable was positively correlated with various measures of firms' profitability in 1994 although only at marginal significance levels (with OPM  $P=.10$ ; with EPS  $P=.07$ ). However, it was not correlated with the *change* in share price or in either OPM or EPS.
- (4) Many specific increases in strategic temp usage may have been positively correlated with the level of OPM in 1994, although the significance levels were marginal: changing occupations ( $P=.11$ ); changing situations where use temps ( $P=.22$ ); increasing permanent hiring through temps ( $P=.28$ ).

Summarizing, there is some evidence that the use of temporaries, particularly in "strategic" ways, is correlated with positive financial outcomes. Certain "strategic" changes in policies regarding temps may have led to high operating margins (OPM). High and/or increasing use of temps may have led to increasing share prices during the early 90's. Alternatively, the causality may have run in the opposite direction. For instance, companies with high operating margins may have been more likely to make "strategic" changes in their use of temps.

The latter direction of causality is suggested by the fact companies with high EPS at the *beginning* of the period later increased their temp usage. On the other hand, changes in temp usage is not correlated with other beginning financial values (such as OPM).



## Time Series Case Studies

In our random survey, we identified one company in the South's fibers/textiles industry that made a sudden shift towards the exclusive use of temporaries for all entry level production jobs. These temporaries are moved into permanent jobs after three months if they "work out". We then surveyed seven other comparable firms, i.e. non-unionized, Southern publicly-owned companies in the fiber/textiles industry. Of these seven, one company had suddenly increased its usage of temporaries for entry-level jobs.

All of these eight companies faced tight labor markets. In the face of this tight supply, they were forced to hire poorer quality employees than they usually did. The temp-to-perm option allowed them to screen workers in a situation where screening was particularly important. But in addition, the two companies who chose this option believed that the temporary agencies could do a better job at attracting workers in this labor market. The other companies had not chosen to use temp-to-perm often for company culture kinds of reasons. ("It builds good will" and "We have pride in our people and value long term relationships".)

We calculated financial measures for these two companies, denoted A and B, using the other six companies as controls. By studying these companies with radical changes in their use of temporaries, we increased the likelihood of the policy having an impact. By narrowly defining both industry and region, we eliminated some of the variation across firms, increasing the likelihood of detecting any effect. Unfortunately, the time period over which we observe the new policy is quite short: Firm A adopted their new policy very early in 1995 while Firm B adopted their's in the fall of 1994. As a result, we have only a few quarters over which to observe the impact of any change.

For each company, we estimated time series regressions on quarterly data for the change in the log of share price and the change in earnings per share (EPS).

$$\ln(P_t / P_{t-1}) = \beta_0 + \beta_1 D_t + \beta_2 \ln(P_{c,t} / P_{c,t-1}) + \sum \beta_l Q_l + e$$

$$\Delta \text{EPS}_t / S_t = \beta_0 + \beta_1 D_t + \beta_2 \Delta \text{EPS}_{c,t} / S_{c,t-1} + \sum \beta_l Q_l + e$$

where  $S_t$  is a scaling factor to account for differences in share price. Two scaling factors

were considered: the share price ( $P_{c,t}$ ) and the average share price of the company over the sample period ( $P_{avg}$ ).<sup>13</sup> OPM was not available for quarterly data.

The independent variables included:  $P_{c,t}$ , the average share price at time  $t$  for the six control companies,  $EPS_{c,t}$ , the average EPS at time  $t$  for the six control companies, and  $D_1$ , a dummy variable that takes the value 1 for all quarters after the change in policy.<sup>14</sup> Since earnings can display pronounced seasonalities seasonal dummy variables,  $Q_i$ , are also included.<sup>15</sup> The sample period was from March 1984 through March 1996. However, when the earlier period fit particularly poorly, estimations are reported for the period of March 1988 through March 1996.

The results are presented in Tables 3 and 4. To illustrate the post-change impact graphically, we have plotted the actual series versus the pre-change predicted values in Figures 1 and 2.

Company A's large change in temporary usage occurred in the beginning of 1995. The first two columns of Table 3 report the results of the share price regression. The dummy variable is not distinguishable from zero with a  $t$ -statistic of 0.60. As expected, the best predictor of share price change in the share price change for the control sample while the quarterly dummies are insignificant or marginally significant. The  $R^2$  is low for both regressions. The results are similar in both the 84-96 and 88-96 sample periods. The graph shows that the 1995/6 quarters look remarkably similar to previous periods: the model based only on the simple independent variables of the trends in comparable companies and quarterly dummies fits the timing of the price swings but the firm's swings were more

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<sup>13</sup> Another way to think of these earnings measures is as a return on equity. This constructed variable is preferable for our purpose to the standard accounting measure for return on equity which is the ratio of net earnings and the "book value" of equity.

<sup>14</sup> In addition, when Durbin-Watson statistics indicated serial correlation, we included moving average (MA) terms, which fit better than AR terms.

<sup>15</sup> Although we would have expected significance beyond the turn of the year seasonal, i.e. the January Effect, the quarterly dummies were included in the share price as well as in EPS equations.



extreme than the six company average.<sup>16</sup> Finally, an F-test of the hypothesis that a model based on pre-change years accurately fits the post-change quarters could not be rejected ( $F=.39$ ,  $P\text{-value}=.85$ ).

In the earnings regression, columns three and four of Table 3, again, the period after the change is similar to the previous period, both in terms of the insignificant coefficient on the dummy variable and in terms of an F-test ( $F=.19$ ,  $P\text{-value}=.96$ ).<sup>17</sup> The regression results and the graph show the strongly seasonal nature of income for this company. There does seem to be a slight change recently in the seasonality of the series: the change in earnings is somewhat less variable than it had been previously and the peak moved to the first quarter (where in the early 90's it was always in the third quarter). However, the change seems to have occurred in 1994, prior to the specific introduction of temporaries.<sup>18</sup>

Company B changed their temping policies in the fall of 1994. During 1995, this company did worse than predicted based on the 6 control companies (and seasonality factors). The share price did worse after the change. In Table 4, the t-statistic of the dummy variable in the 88-96 model, which far better matches the industry, is -1.79 and significant at the 10% level. The F-test of whether the latter period fits the earlier model is  $F=1.59$  which has a P-value of .20. Similarly, the actual  $EPS/P_{t-1}$  is far lower than predicted based on the industry and previous trends. The dummy variable in the last column of Table 4 has a t-statistic of -2.17. The F-test for the similarity of the post-change period is 6.94 ( $P=.0003$ ).

Thus, in these two companies, the period of intensive use of temporaries as a hiring device was accompanied by very different profitability. In one, the radical HR change could not be detected in share price or earnings, except that perhaps we saw a slightly dampened

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<sup>16</sup>As would be expected since a portfolio with offsetting idiosyncratic risks will exhibit lower return variability than a single investment.

<sup>17</sup>Results using the alternative EPS measure are similar as those reported here both in the case of Company A and Company B.

<sup>18</sup>The extreme points at the first and second quarters of 1990 are the result of a negative EPS.

variability in earnings. In Company B, the company fared far worse during the period of increased use of temporaries.

### **Summarizing These Profitability Results**

Our expectation entering this exercise is that we would find no significant correlations of temporaries on financial measures, given the standard difficulties of measuring impacts of HR policies and given the small samples. The cross sectional results suggests that there may be some correlations. While this is in no way indicative of causality, they provide a beginning shred of evidence that "strategic staffing" may increase operating margins and company value.

On the other hand, the time series case study suggests either no impact or a negative impact for manufacturing companies choosing to hire all entry-level production workers as temps. The two conclusions are in no way mutually exclusive: most companies who increase their use of temps use them for particular situations, such as temporary projects or seasonal fluctuations, rather than for all hires. The more selective use might be profitable while a more blanket approach might be counter-productive.

Table 1: Percentage of Sample Who Changed Use of Temporaries

	increased > 100%	increased somewhat (10-100%)	small or no change (< 10% change)	decreased a lot (> 10%)
{Over the past 3 to 5 years, have you increased or decreased the number of temporaries that you hire?} Does this represent a change in the percent of total employment?	8.6%	28.6%	37.1%	25.7%
Has the length of stay of temps changed over the past 3 to 5 years?	0	38.2%	52.9%	8.8%
In the past 3 to 5 years, have there been changes in the percent of (full-time regular ) hires who began working at your company as a temp? <sup>19</sup>	9.4%	18.8%	71.9%	0
	% changed			
[In what kinds of situations does your company use temps?] Has this changed over the past 3 to 5 years?	44.1%			
[What kinds of jobs do you use temporaries for?] Has this changed over the past 3 to 5 years?	46.8%			
Have you used this same source of temps over the past 3 to 5 years, or does this represent a change? <sup>20</sup>	50.0%			

19. Wording different from actual question, which culminated a series of questions about the number of temps hired permanently and the number of total employees hired into comparable jobs.

20. This number excluded changes in vendors' identities that weren't accompanied by other changes in the source, such as a change in the number of agencies used.

**Table 2: Situations in Which Large Companies Use Temporaries**

	% of companies who mention
temporary projects	88.2
replacement for temporary absences	85.7
seasonal fluctuations	50.0
new projects	48.6
downsizing, termination	25.7
buffer against layoffs	22.9

**Table 3**  
**Case Study: Impact of Large Increase in Temporary Usage**  
**in a Large Fiber/Fabric Manufacturing Company's Production Workers**  
**Firm A**

Dependent variable	$\ln(P_t / P_{t-1})$		$\Delta \text{EPS}/P_{t-1}$	
time period (# observations)	84:2 - 96:1 (48)	88:1 - 96:1 (33)	84:2 - 96:1 (48)	84:2 - 96:1 (48)
Dummy for temp change	.014 (.069)	.039 (.065)	.003 (.011)	.002 (.009)
Avg for 6 control companies	.377 (.222)	.607 (.236)	.020 (.072)	-.010 (.055)
constant	-.030 (.042)	-.041 (.047)	-.017 (.007)	-.018 (.005)
Q1	.046 (.061)	.035 (.065)	.007 (.010)	.009 (.008)
Q2	.110 (.059)	.120 (.066)	.031 (.010)	.034 (.007)
Q3	-.029 (.058)	-.053 (.065)	.030 (.009)	.031 (.007)
R <sup>2</sup> adj.	.19	.21	.21	.53
D-W	1.86	2.05	2.69	1.82
MA terms?	no	yes	no	yes

Standard errors in parentheses.



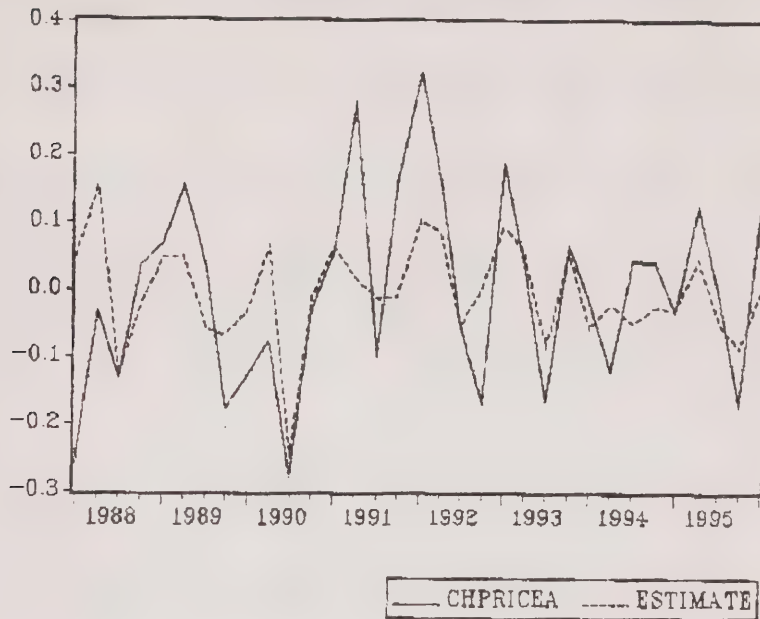
**Table 4**  
**Case Study: Impact of Large Increase in Temporary Usage**  
**in a Large Fiber/Fabric Manufacturing Company's Production Workers**  
**Firm B**

Dependent variable	$\ln(P_t / P_{t-1})$		$\Delta \text{EPS}/P_{t-1}$	
time period (# observations)	84:3 - 96:1 (47)	88:1 - 96:1 (33)	84:3 - 96:1 (47)	88:1 - 96:1 (33)
Dummy for temp change	-.135 (.111)	-.133 (.074)	-.007 (.013)	-.006 (.003)
Avg for 6 control companies	.817 (.388)	.224 (.292)	.075 (.095)	-.004 (.020)
constant	.073 (.075)	.100 (.060)	.009 (.009)	.003 (.075)
Q1	-.016 (.106)	-.041 (.071)	-.027 (.013)	-.016 (.106)
Q2	-.004 (.105)	-.086 (.082)	-.013 (.013)	-.004 (.105)
Q3	-.050 (.103)	-.140 (.082)	.018 (.012)	-.050 (.103)
R <sup>2</sup> adj.	.05	.20	.16	.59
D-W	2.05	1.93	1.32	2.01
MA terms?	no	yes	no	no

Standard errors in parentheses.

Figure 1

Case Study: Time Series plot of the log change in share price (CHPRICEA) and estimated price change (ESTIMATE) of Company A



Case Study: Time Series plot of the change in EPS (CHEPSA) and estimated change (ESTIMATE) of Company A

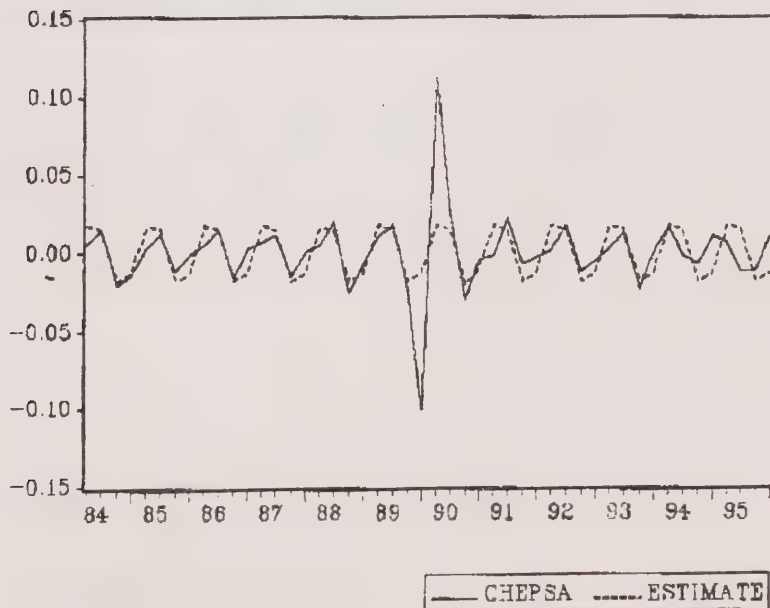
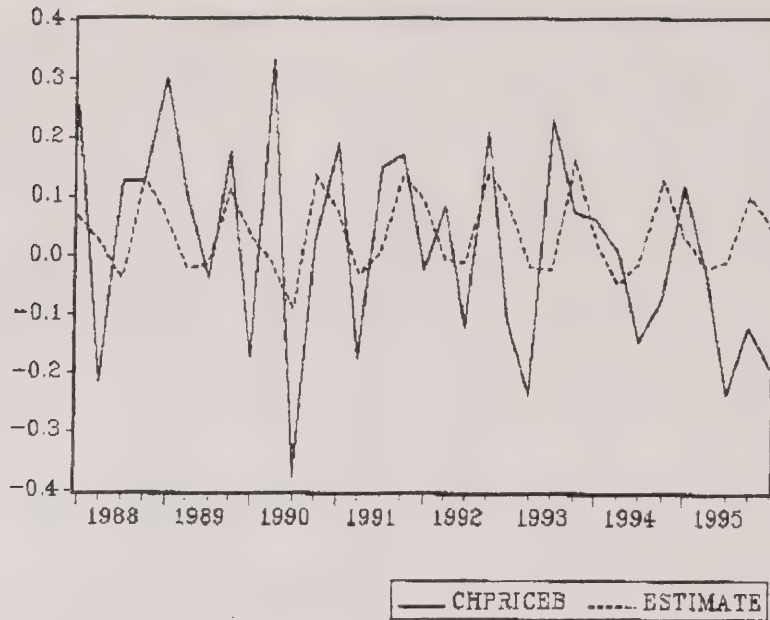
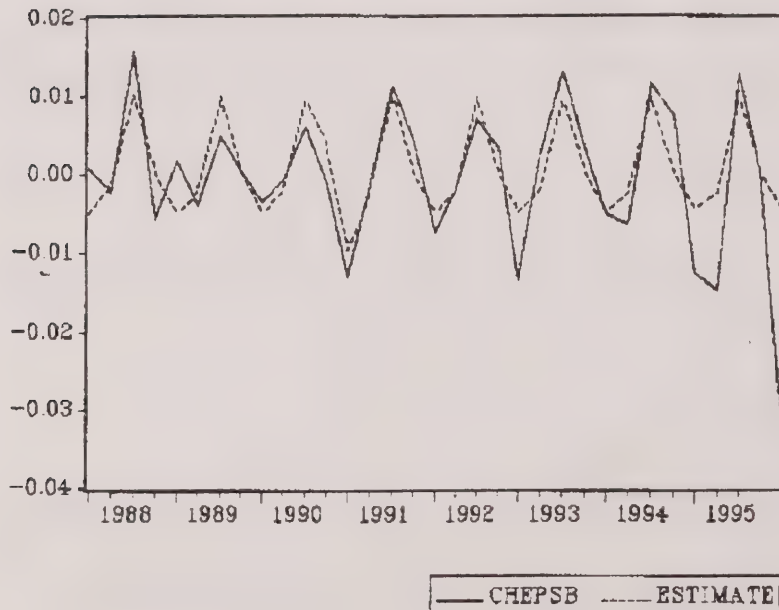


Figure 2

Case Study: Time Series plot of the log change in share price (CHPRICEB) and estimated price change (ESTIMATE) of Company B



Case Study: Time Series plot of the change in EPS (CHEPSB) and estimated change (ESTIMATE) of Company B



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## **Session 4A (iv)**

### **Labour Force Participation and Work Hours of Young Men and Women**

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Labor Force Participation and Hours of Work of  
Young Men and Women

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May, 1996

\*Data used in this paper were made available by the Interuniversity Consortium for Political and Social Research. Neither the collectors of the original data nor the ICPSR bears any responsibility for the analyses and interpretations presented here.



## I. Introduction

Although volumes have been written about the labor supply of adult men and women, the labor supply behavior of teenage men and women has not been studied extensively by economists. This is likely due to the fact that much of the time available to people in the late teens is devoted to schooling. However, even among those whose primary activity is schooling, labor force participation is quite high. For example, in 1980 about 35 per cent of men and women in the 16 to 17 age group was in the labor force. Even though work is not the primary activity of teenagers, a substantial fraction of them are active in the work force.

This paper examines the labor market behavior of young men and women aged 16 to 17 years old. This is an interesting group to look at because work decisions of these youth may have a significant impact on later earnings and employment. This is a time of life that most youth are involved primarily in schooling. It is possible that trade-offs between work and schooling may affect the amount of human capital that teenagers eventually acquire. Also, this is a group that is likely to be affected by minimum wage policies. A better understanding of their behavior may help us understand the effects of such policies.

An important aspect of the youth labor market is that young men and women are closely tied economically to the households of their parents. Few men and women of this young age work enough to support themselves. In the US, household formation begins at later ages. It is likely that the labor supply



decisions of mothers and fathers have significant impact on the behavior of their working-aged children, and perhaps vice versa. For example, in households where both parents work, older children may have more responsibility in the home, and work less in the market. For this age group, observable human capital characteristics of individuals differ little. The decision to work, both because of the willingness to work (the reservation wage) and the desirability of work (the market wage) may depend more on family characteristics than individual characteristics. This paper examines these issues.

Section II discusses theoretically the relationship between the youth labor market decisions and the family. Section III of this paper discusses the CPS data used in this paper, and also describes some recent trends in youth labor force participation and employment in the United States. Section IV present results of regression analysis of labor force participation and school attendance.

## II. Models of Family Labor Supply

There is no consensus in economics on the proper way to model the interrelatedness of family labor supply decisions. Many of the empirical models preclude joint labor supply decisions of family members. For example, many studies of the labor supply of married women treat the earnings of the husband as exogenous, as in Cogan (1981) and Nakamura and Nakamura (1981). Other studies ignore family status completely.

Another model that has been quite popular is based on a "family" utility

function. In this model, the members of the family (generally only the husband and wife) behave to maximize a joint utility function whose arguments are the leisure of each family member and the total income of the family. For example, this model is explicitly or implicitly found in papers by Kooreman and Kapteyn (1986), Blundell and Walker (1982 and 1986) and Ransom (1987a and 1987b). Extending the model to include young adult children is straightforward.

Recently, bargaining models of family labor supply have been proposed. In these models, the decisions of the family are treated as the outcomes of a (two-person) cooperative game.<sup>1</sup> Bargaining models can be thought of as generalizations of the joint utility model. The best example of this type of model is McElroy's (1985) analysis of household formation and labor force participation of young men. Lundberg's (1988) study of husband-wife labor supply is also implicitly consistent with the bargaining approach.

These models have been used to describe the interrelatedness of labor market decisions of husbands and wives. The application to children in the family is a little less clear. Children will eventually leave the household and form their own families, but economic ties to parents are probably never completely severed. The same altruism that leads parents to share of their wealth while children belong to the household may lead parents to share even when the children form their own households. For example, children of wealthy parents may expect substantial

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<sup>1</sup>See, for example, McElroy and Horney (1981).

bequests at some time in their lives. McElroy (1985) provides another example. She interprets her study of household formation and labor supply of young men to show that parents act as a sort of unemployment insurance--a failure in the job market often means that a young man will return to the household of his parents. If leisure is a normal good, higher lifetime income will lead to fewer work hours during the lifetime. In particular, this will lead to a delay in the start of work life.

Even in a static version of the "family" labor supply model, young men and women will have access to a share of much higher consumption levels if they live in a wealthy household. This suggests that teenagers in low income households should have higher labor force participation rates and work more hours.

Empirical analysis of youth labor supply has not provided much support for these predictions. Rees and Gray (1982) examined this issue in some detail. They analyzed a large sample of young men and women (aged 17 to 20 in 1976). For most of the demographic groups that they analyzed, increases in the income of other family members decreased hours of work and decreased labor force participation rates. They interpret their findings to mean that higher income parents are able to gain access to (market-rationed) jobs for teenagers in the family. McDonald and Stephenson (1979) found some weak supporting evidence. They analyzed a small group of teenagers (16-18years old) from the Gary income maintenance experiment. They found that the treatment group exhibited a small, statistically insignificant reduction in labor force participation and a small increase in school attendance.

### III. Data

General trends in labor force and employment status of teenage workers are reported in Tables 1 and 2, and in Figure 1. Table 1 reports labor force participation rates of young men and women by sex and race groups from the March CPS of 1980 through 1990. Labor force participation rates are shown graphically in Figure 1. The most apparent "fact" is that the labor force participation rates of black men and women are dramatically lower than those for whites. This phenomenon has been studied extensively--for example, the book edited by Freeman and Holzer (1986) reports several studies that analyze this black/white disparity from the late 1970s. However, the very low relative rate of labor force participation has not changed over the 1980's. Black labor force participation among high-school-aged men and women has remained at about half of that for whites. Because of higher rates of unemployment among blacks, relative employment ratios are even lower.

Another pattern that is quite striking is that labor force participation rates of white women have increased relative to the rates for white men. Since 1985, labor force participation rates of teenage men and women have been roughly the same. (Over the same period, employment rates of women have actually been higher than for men.)

The data used in this analysis come the March version of the Current Population Survey (CPS). The March supplement to the CPS is the Annual Demographic Survey, and contains detailed information about the incomes of

family members, as well as the standard CPS questions about labor force status. I have analyzed three different years of data that span the 1980s: 1980, 1985 and 1989.

The sample for this study contains families who have a son or daughter aged 16 or 17. Furthermore, all households containing multiple families are eliminated. Each teenager in the sample is matched to his parents (or parent). Those teenagers that do not reside in a family household are also excluded from the sample. In a few cases there are multiple observations for a family, if there are two teenagers of relevant age in the family. In such a case each teenager and parent match is treated as a separate observation. I have not analyzed families headed by a single father because of the small sample sizes.

Table 3 presents characteristics of the samples used in the regression analyses that follow. Individuals "In Labor Force" are defined as those who are were working during the preceding week, or who held a job but did not work, or who were actively looking for work. Individuals are considered to be "At School" if their "major activity" during the preceding week was attending school. Labor force participation rates for men fell significantly from 1980. Aside from 1980, participation rates for women are close to those for men, except in households headed by a single mother--women's rates are much lower in those cases. In part this reflects that single-mother families are made up of a much higher proportion of non-whites. School attendance rates were lower for all groups in 1980, and are higher for individuals in dual-parent homes for all years.



Parent income is the sum of the total personal incomes of the parents.

Parent income levels are defined by a set of dummies. Intervals are defined so that about 10 percent of families in 1989 are in the lowest group and 10 percent in the highest group. These are based on nominal incomes--no attempt has been made to adjust for inflation over the time period. Other variables used in the analysis are indicators of region, whether the individual resides in a central city or a large metropolitan area, race and whether the individual is 16 years old.

This analysis of labor supply does not include a measure of the wage rate for individual teenagers. There is little difference in observable human capital characteristics of these young teenagers. Thus, the emphasis of this study is on how teens respond to changes in family income levels.

## V. Estimates

Probit regression models are estimated to describe labor force participation and school attendance for men and women for each year. Table 4a reports the results of the labor force participation regressions for families with both parents present. (Table 4b is for single-mother families.) Generally, youth that live in large metropolitan areas, and in central cities have lower labor force participation rates, but these effects are typically not statistically significant. There are fairly large regional differences that vary a lot across time periods. Also, white youth have much higher participation rates. Sixteen-year-olds have much lower participation rates than seventeen-year-olds.

Results for dual-parent families indicate that labor force participation is highest when parental incomes are in the \$50,000-75,000 income range.<sup>2</sup> Participation is lower among both lower and higher income groups. For men, participation among the highest income group is even lower than among the lowest income group. This finding is at odds with some previously published work. For example, Rees and Gray (1982) report that increases in family income increase labor force participation. Participation among high income women is higher than for men.

Labor force participation estimates for teenagers in single-mother families are generally similar to those for dual-parent families. Parental incomes are much lower (as expected), and many of the income groups defined here are empty for these samples. Thus, it is not possible to compare results directly with the dual-parent families. However, participation is clearly higher for low and middle incomes compared to the lowest income group.

One way to interpret these results is that parent incomes can influence both the reservation wage and the market wage. Models we have discussed above suggest that increases in parental income will increase a teenager's income, either through life-cycle access to greater bequests of income and human capital, or through sharing in the higher current income of the household even if there is no

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<sup>2</sup> A linear probability model regression measures that the participation rate for the \$50,000-75,000 group is about 9 percent higher than for the lowest income group.

expectation of bequests. Either should raise the reservation wage--a wealthier teenager will enter the labor force later in life (and probably leave the labor force earlier). On the other hand, higher income households may have access to higher market wages for teenagers, too. For example, they may live in areas with higher general wage levels, or parental contacts may give teenagers access to "better" jobs.

The most productive alternative to work for most teenagers in the acquisition of human capital through schooling. Estimates of probit regression models of school attendance are in Tables 5a (for dual-parent families) and 5b (for single-mother families). For youths in dual-parent families, increases in income are generally associated with higher school attendance, except for the very highest income group. This is true for all groups except males in 1989. For single-mother households, school attendance does not seem to be related to parent income level. For both family types there are large, statistically significant differences across regions. These differences do not appear to be stable over time. White teenagers have lower school attendance rates.

## VI. Summary

In this paper I have examined how labor force participation and school attendance rates for 16- and 17-year-old men and women is influenced by the income of their parents. Family income is an important determinant of labor force activity among teenagers. Labor force participation is most likely for teenagers

whose parents are in the middle of the income distribution. This finding is at odds with predictions of models of the family, as teenagers in wealthier families should have higher reservation wages. However, membership in a high-income family may also increase the market wage for teenagers, through better labor market contacts, for example. Within that context, the results of this study suggest that the market wage effect is more important at incomes below the median, and that the reservation wage effect is more important at higher incomes.

Surprisingly, parent income is less effective in predicting school attendance. Generally, attendance appears to increase with parent incomes, but for some of the samples this is not the case. In particular, in the 1989 sample of young men, parent incomes appear to have little relationship with school attendance rates. This is also true in single-mother households.

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Table 1  
Labor Force Participation: 16-17 Yr Old

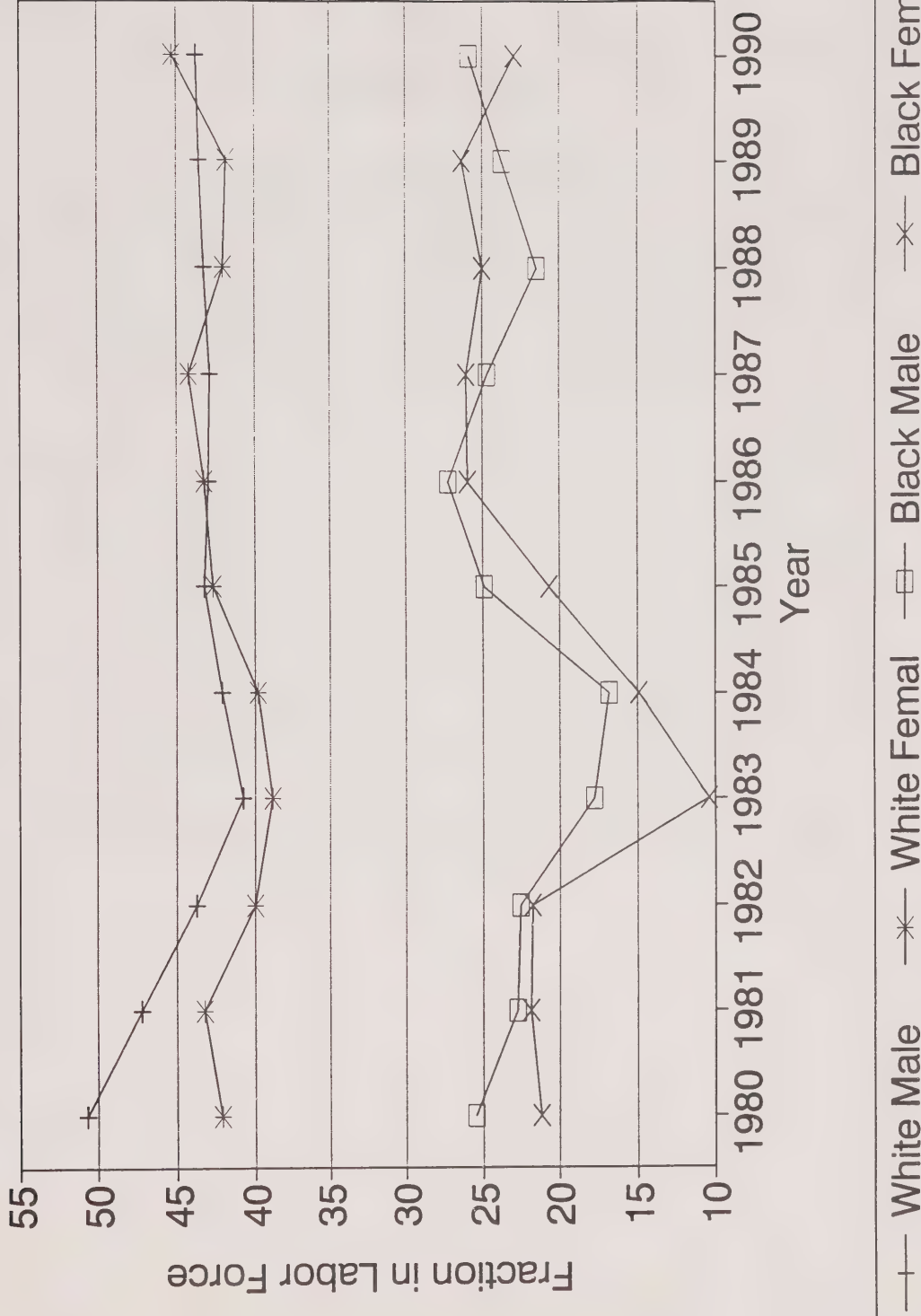


Table 1

Labor Force Participation Rates of 16 & 17 Year-old Youth  
(During March of each year)

	<u>All Race Groups</u>		<u>WHITE</u>		<u>BLACK</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
1980	46.7	38.7	50.7	42.1	25.4	21.2
1981	43.2	39.6	47.2	43.2	22.7	21.9
1982	40.3	36.4	43.7	40.0	22.5	21.8
1983	36.9	34.1	40.7	38.8	17.8	10.3
1984	37.8	35.4	42.1	39.8	16.8	14.9
1985	40.1	38.9	43.2	42.7	24.9	20.7
1986	40.1	39.9	43.0	43.2	27.2	25.9
1987	39.8	40.8	42.9	44.2	24.7	26.0
1988	39.4	39.0	43.2	42.0	21.5	25.0
1989	39.5	38.9	43.5	41.8	23.7	26.3
1990	40.1	41.0	43.7	45.3	25.8	22.9

SOURCE: "Employment status of noninstitutional population by sex, age, and race."  
Employment and Earnings, April, various years.

Table 2

Employment Rates for 16 & 17 Year-old Men and Women  
(During March of Each Year)

Year	<u>All Race Groups</u>		<u>White</u>		<u>Black</u>	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
1980	37.6	31.2	41.6	34.7	16.2	13.1
1981	32.5	30.8	36.4	34.8	13.0	11.5
1982	29.2	28.4	33.0	31.5	9.7	13.7
1983	26.1	25.6	29.6	29.4	8.7	6.6
1984	28.2	27.1	32.2	31.3	7.8	6.5
1985	30.4	31.2	33.8	35.0	13.8	12.6
1986	31.2	32.1	34.7	35.9	14.9	15.0
1987	31.0	32.6	34.2	36.4	14.2	14.8
1988	31.6	32.4	34.6	36.0	16.4	15.6
1989	33.0	33.1	36.6	36.7	17.8	16.1
1990	33.3	34.1	37.3	38.0	16.0	16.5

Source: Calculated from "Employment Status of Noninstitutional Population by Sex, Age and Race," Employment and Earnings, various years.

Table 3  
Summary Statistics for Regression Data  
Means and Standard Deviations

	1989				1985				1980			
	Men		Women		Men		Women		Men		Women	
Variable	H/W Family	Single Mother	H/W Family	Single Mother	H/W Family	Single Mother	H/W Family	Single Mother	H/W Family	Single Mother	H/W Family	Single Mother
In Labor Force	0.412 (0.492)	0.416 (0.494)	0.410 (0.492)	0.375 (0.485)	0.414 (0.493)	0.401 (0.491)	0.417 (0.493)	0.374 (0.484)	0.478 (0.500)	0.429 (0.495)	0.422 (0.494)	0.341 (0.477)
At School	0.874 (0.332)	0.819 (0.385)	0.880 (0.325)	0.843 (0.365)	0.877 (0.328)	0.824 (0.381)	0.888 (0.316)	0.864 (0.343)	0.833 (0.373)	0.797 (0.403)	0.841 (0.366)	0.797 (0.403)
Parent Income <15K	0.108 (.310)	0.649 (0.478)	0.114 (0.318)	0.620 (0.486)	0.176 (0.381)	0.698 (0.460)	0.162 (0.369)	0.635 (0.482)	0.235 (0.424)	0.826 (0.380)	0.233 (0.423)	0.864 (0.341)
Parent Income 15K-30K	0.229 (0.420)	0.264 (0.442)	0.213 (0.409)	0.280 (0.450)	0.296 (0.457)	0.261 (0.440)	0.300 (0.458)	0.310 (0.463)	0.488 (0.500)	0.157 (0.364)	0.481 (0.500)	0.133 (0.347)
Parent Income 30K-50K	0.351 (0.477)	0.084 (0.277)	0.337 (0.473)	0.083 (0.275)	0.344 (0.475)	0.036 (0.187)	0.333 (0.471)	0.048 (0.215)	0.219 (0.413)	0.014 (0.116)	0.233 (0.423)	0.002 (0.077)
Parent Income 50K-75K	0.217 (0.412)	0.003 (0.051)	0.211 (0.408)	0.015 (0.122)	0.131 (0.338)	0.002 (0.047)	0.139 (0.346)	0.004 (0.066)	0.052 (0.223)	0.003 (0.058)	0.050 (0.217)	-0.0 0.0
Parent Income 75K +	0.096 (0.295)	-0- -0-	0.126 (0.332)	0.003 (0.050)	0.053 (0.224)	0.002 (0.047)	0.065 (0.247)	0.002 (0.047)	0.006 (0.079)	0 0	0.004 (0.969)	0 0
Northeast	0.195 (0.409)	0.212 (0.409)	0.219 (0.414)	0.235 (0.425)	0.221 (0.415)	0.286 (0.452)	0.232 (0.422)	0.268 (0.443)	0.204 (0.403)	0.232 (0.423)	0.209 (0.407)	0.277 (0.448)
Midwest	0.264 (0.442)	0.264 (0.442)	0.274 (0.446)	0.238 (0.426)	0.267 (0.443)	0.232 (0.423)	0.251 (0.434)	0.198 (0.399)	0.258 (0.438)	0.186 (0.390)	0.252 (0.434)	0.205 (0.404)
West	0.210 (0.407)	0.188 (0.392)	0.202 (0.402)	0.188 (0.391)	0.243 (0.429)	0.223 (0.417)	0.229 (0.420)	0.218 (0.413)	0.260 (0.438)	0.227 (0.419)	0.257 (0.437)	0.182 (0.386)
Central City Residence	0.161 (0.368)	0.366 (0.482)	0.157 (0.364)	0.315 (0.465)	0.180 (0.385)	0.367 (0.483)	0.178 (0.382)	0.371 (0.484)	0.174 (0.379)	0.354 (0.479)	0.169 (0.375)	0.366 (0.483)
Metro Area (3 million +)	0.093 (0.290)	0.175 (0.381)	0.104 (0.305)	0.110 (0.313)	0.065 (0.246)	0.113 (0.316)	0.068 (0.252)	0.108 (0.310)	0.131 (0.338)	0.185 (0.388)	0.115 (0.319)	0.196 (0.397)
Metro Area (2-3 million)	0.105 (0.307)	0.154 (0.362)	0.133 (0.340)	0.258 (0.365)	0.079 (0.270)	0.115 (0.319)	0.086 (0.280)	0.070 (0.256)	0.166 (0.372)	0.210 (0.408)	0.160 (0.366)	0.196 (0.397)
White	0.899 (0.301)	0.647 (0.479)	0.880 (0.325)	0.693 (0.462)	0.899 (0.301)	0.739 (0.440)	0.902 (0.298)	0.732 (0.443)	0.910 (0.286)	0.682 (0.466)	0.902 (0.298)	0.667 (0.472)
Age = 16	0.476 (0.500)	0.505 (0.501)	0.512 (0.500)	0.450 (0.498)	0.525 (0.500)	0.511 (0.500)	0.501 (0.500)	0.495 (0.501)	0.505 (0.500)	0.516 (0.500)	0.518 0.500	0.567 (0.496)
N =	1496	382	1433	400	1735	444	1687	455	2558	585	2455	556



Table 4a  
Labor Force Participation  
Probit Regression Results  
(Standard errors are in parentheses)

Youths Aged 16 & 17 in Families with Both Parents Present

	1989		1985		1980	
	Male	Female	Male	Female	Male	Female
Intercept	-0.7779 (0.1605)	-0.8870 (0.1584)	-0.6780 (0.1379)	-0.9615 (0.1421)	-0.5766 (0.1093)	-0.7651 (0.1063)
Parent Income 15K-30K	0.1719 (0.1256)	0.3242 (0.1306)	0.2532 (0.0944)	0.3618 (0.1019)	0.1807 (0.0644)	0.2140 (0.0674)
Parent Income 30K-50K	0.2418 (0.1192)	0.2679 (0.1230)	0.2999 (0.0924)	0.5848 (0.1000)	0.2827 (0.0768)	0.3515 (0.0779)
Parent Income 50K-75K	0.1806 (0.1271)	0.3284 (0.1312)	0.2523 (0.1147)	0.5760 (0.1192)	0.1211 (0.1225)	0.2259 (0.1300)
Parent Income 75K +	-0.0441 (0.1528)	0.1796 (0.1456)	-0.0544 (0.1573)	0.2641 (0.1507)	-0.1135 (0.3279)	-0.0485 (0.4388)
Northeast	0.1213 (0.0980)	0.3685 (0.0996)	-0.0586 (0.0919)	0.0635 (0.0906)	0.0835 (0.0768)	0.2241 (0.0781)
Midwest	0.2070 (0.0880)	0.5197 (0.0929)	0.2612 (0.0853)	0.3448 (0.0873)	0.2447 (0.0710)	0.3450 (0.0731)
West	-0.0110 (0.0940)	0.2695 (0.0998)	-0.0441 (0.0876)	0.2660 (0.0899)	0.1633 (0.0701)	0.2543 (0.0725)
Central City	-0.1845 (0.0971)	-0.1430 (0.0987)	-0.0545 (0.0838)	-0.1068 (0.0862)	0.0991 (0.0701)	-0.0098 (0.0722)
Metro Population 3 Million +	-0.1565 (0.1221)	-0.0944 (0.1190)	-0.1482 (0.1330)	-0.3336 (0.1347)	-0.1864 (0.0819)	-0.0382 (0.0874)
Metro Population 2-3 Million	-0.2046 (0.1147)	-0.0849 (0.1041)	-0.1070 (0.1157)	0.1982 (0.1133)	0.0240 (0.0704)	0.2331 (0.0725)
White	0.5578 (0.1253)	0.3978 (0.1152)	0.4037 (0.1124)	0.4524 (0.1168)	0.4925 (0.0956)	0.3716 (0.0959)
Age 16	-0.2723 (0.0669)	-0.3705 (0.0686)	-0.2650 (0.0618)	-0.4272 (0.0634)	-0.4080 (0.0505)	-0.3933 (0.0520)
Sample Size	1496	1433	1735	1687	2558	2455

Table 4b  
Labor Force Participation  
Probit Regression Results  
(Standard errors are in parentheses)

Youths Aged 16 & 17 in Families with Single Mother

	1989		1985		1980	
	Men	Women	Men	Women	Men	Women
Intercept	-0.3611 (0.1750)	-0.3048 (0.1661)	-0.3994 (0.1897)	-0.7738 (0.2020)	-0.5665 (0.1501)	-0.5890 (0.1542)
Parent Income 15K-30K	0.3437 (0.1572)	0.4001 (0.1510)	0.2855 (0.1452)	0.5726 (0.1374)	0.3174 (0.1497)	0.2194 (0.1661)
Parent Income 30K-50K	0.3550 (0.2508)	0.1830 (0.2425)	0.6305 (0.3463)	0.5312 (0.2904)	-0.3976 (0.4638)	7.1955 (9664.7590)
Parent Income 50K-75K	6.1539 (10611.4700)	0.5664 (0.5397)	-6.0441 (10611.4700)	-6.3578 (12249.7100)	-6.0783 (7437.6150)	0.0000 (0.0000)
Parent Income 75K +	0.0000 (0.0000)	-5.7572 (10611.4700)	7.0180 (10611.4700)	-6.4547 (17386.1100)	0.0000 (0.0000)	0.0000 (0.0000)
Northeast	-0.2211 (0.2049)	-0.1638 (0.1877)	-0.2868 (0.1773)	-0.1615 (0.1781)	-0.1274 (0.1572)	0.0117 (0.1662)
Midwest	0.1209 (0.1885)	0.1483 (0.1811)	-0.0470 (0.1816)	0.2397 (0.1853)	0.1694 (0.1582)	0.3256 (0.1648)
West	0.2033 (0.1978)	-0.1657 (0.1960)	-0.0687 (0.1830)	0.1416 (0.1787)	0.2879 (0.1538)	0.2784 (0.1778)
Central City	-0.1042 (0.1651)	-0.2188 (0.1553)	-0.1130 (0.1420)	-0.3887 (0.1483)	0.0958 (0.1283)	0.0230 (0.1382)
Metro Population 3 Million +	-0.1284 (0.2206)	-0.2511 (0.2405)	-0.3563 (0.2199)	0.1740 (0.2257)	-0.3017 (0.1662)	-0.6146 (0.1798)
Metro Population 2-3 Million	-0.1214 (0.2039)	-0.0662 (0.1874)	-0.2684 (0.2013)	0.1746 (0.2510)	0.0188 (0.1412)	-0.3093 (0.1591)
White	0.4738 (0.1634)	0.2397 (0.1549)	0.5188 (0.1570)	0.6895 (0.1677)	0.6278 (0.1295)	0.4678 (0.1453)
Age 16	-0.4823 (0.1369)	-0.4319 (0.1337)	-0.2654 (0.1258)	-0.4727 (0.1289)	-0.2903 (0.1083)	-0.2875 (0.1163)
Sample Size	382	400	444	455	585	556

Table 5a  
School Attendance  
Probit Regression Results  
(Standard Errors are in Parentheses)

Youths Aged 16 & 17 in Families with Both Parents

Variable	1989		1985		1980	
	Male	Female	Male	Female	Male	Female
Intercept	0.9272 (0.1862)	0.8792 (0.1831)	0.8327 (0.1756)	1.0664 (0.1779)	0.9015 (0.1310)	0.9007 (0.1209)
Parent Income \$15K to \$30K	-0.0976 (0.1508)	-0.0873 (0.1500)	0.0457 (0.1142)	0.0057 (0.1262)	0.2459 (0.0734)	0.1569 (0.0772)
Parent Income \$30K to \$50K	-0.0028 (0.1452)	0.1836 (0.1454)	0.1646 (0.1136)	0.0241 (0.1252)	0.2394 (0.0891)	0.0829 (0.0893)
Parent Income \$50K to \$75K	0.2139 (0.1613)	0.3014 (0.1621)	0.3702 (0.1565)	0.0968 (0.1563)	0.3008 (0.1481)	0.5689 (0.1846)
Parent Income More than \$75K	0.0745 (0.1895)	0.1003 (0.1752)	0.3026 (0.2029)	-0.1714 (0.1820)	0.3748 (0.3941)	0.3550 (0.5788)
Northeast Region	0.0961 (0.1194)	0.0238 (0.1262)	0.4400 (0.1163)	0.2900 (0.1143)	0.2574 (0.0910)	0.2084 (0.0923)
Midwest Region	0.3787 (0.1152)	0.0726 (0.1187)	0.4192 (0.1069)	0.4175 (0.1147)	0.3263 (0.0850)	0.3020 (0.0882)
West Region	0.2479 (0.1176)	-0.0525 (0.1228)	0.5482 (0.1148)	0.3076 (0.1152)	0.0870 (0.0800)	0.0314 (0.0825)
Central City Residence	-0.1257 (0.1174)	0.0533 (0.1260)	-0.0091 (0.1070)	-0.0951 (0.1079)	-0.0822 (0.0815)	-0.1189 (0.0842)
Metro Population 3 Million +	0.0736 (0.1591)	0.1056 (0.1553)	-0.1809 (0.1696)	0.1478 (0.1872)	0.0912 (0.1016)	0.1086 (0.1109)
Metro Population 2-3 Million	0.1748 (0.1495)	0.1565 (0.1400)	0.0979 (0.1586)	0.0903 (0.1502)	0.0601 (0.0843)	-0.1373 (0.0845)
White	-0.0572 (0.1452)	-0.0020 (0.1373)	-0.3318 (0.1529)	-0.3014 (0.1537)	-0.4279 (0.1204)	-0.2661 (0.1122)
Age 16	0.1971 (0.0852)	0.2932 (0.0877)	0.4181 (0.0811)	0.4302 (0.0844)	0.2462 (0.0601)	0.2782 (0.0620)
Sample Size	1496	1433	1735	1687	2558	2455

Table 5b  
School Attendance Probit Regression Results  
(Standard Errors are in Parentheses)

Youths Aged 16 & 17 in Families with Single Mother

	1989		1985		1980	
	Male	Female	Male	Female	Male	Female
Intercept	0.8297 (0.1956)	1.2392 (0.2157)	0.6829 (0.2147)	1.0908 (0.2403)	0.6357 (0.1613)	0.6781 (0.1604)
Parent Income	0.2976 (0.1877)	-0.1440 (0.1786)	0.1153 (0.1748)	-0.0355 (0.1675)	0.4893 (0.1919)	0.0604 (0.1883)
Parent Income	0.4314 (0.3138)	-0.0573 (0.2977)	-nc- -nc-	-0.1298 (0.3342)	-0.3747 (0.4745)	-0.4450 (0.7868)
Parent Income	5.9891 -nc-	-0.6495 (0.5601)	-nc- -nc-		5.3710 (7453.6980)	-- --
Parent Income	---- ----	-nc- -nc-	-nc- -nc-		-- --	-- --
Northeast	0.0856 (0.2332)	0.1568 (0.2197)	0.3309 (0.2012)	0.2786 (0.2132)	0.3089 (0.1787)	-0.4190 (0.1821)
Midwest	0.2914 (0.2228)	0.2230 (0.2167)	0.6642 (0.2256)	0.2366 (0.2256)	0.3167 (0.1836)	-0.1853 (0.1836)
West	-0.0282 (0.2205)	0.5030 (0.2464)	0.1050 (0.2052)	0.0766 (0.2124)	-0.0544 (0.1674)	-0.3116 (0.1972)
Central City	-0.3676 (0.1862)	-0.1482 (0.1854)	-0.0434 (0.1676)	-0.1244 (0.1774)	-0.0627 (0.1428)	0.1328 (0.1498)
Metro Population More than 3 Million	0.1501 (0.2518)	1.0172 (0.4682)	0.3961 (0.2830)	-0.1832 (0.2678)	0.2117 (0.1937)	0.3098 (0.1918)
Metro Population 2-3 Million	0.1134 (0.2341)	-0.0592 (0.2183)	0.6589 (0.2857)	-0.7718 (0.2566)	0.0122 (0.1588)	-0.1704 (0.1651)
White	-0.3361 (0.1883)	-0.5829 (0.2047)	-0.3711 (0.1834)	-0.2850 (0.1973)	-0.1974 (0.1441)	0.1340 (0.1546)
Age 16	0.4707 (0.1601)	0.2004 (0.1621)	0.3103 (0.1487)	0.5876 (0.1604)	0.3022 (0.1214)	0.3861 (0.1248)
Sample Size	382	400	444	455	585	556

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United States and Canada**

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W.E. Upjohn Institute for Employment Research.**





# **THE LIFE CYCLE OF WORKING TIME IN THE UNITED STATES AND CANADA\***

**Draft of paper to be presented at the June, 1996 Conference on Changes in  
Working Time in Canada and the United States**

**Ottawa, Canada**

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# **The Life Cycle of Working Time in the United States and Canada: An Overview**

## **1. Introduction**

This paper will discuss longterm changes in the life cycle of working time in the United States and Canada since 1920. The past seventy-five years have seen great changes in weekly hours of work, and divergent trends in the participation rates of men and women. These changes have been associated with equally remarkable movements in wages. A major purpose of the paper is to consider the relationship between wage change and labour supply in the working lives of groups of individuals.

International comparisons help us to understand the extent to which developments in one's country are unique or are common to other nations. This is certainly important when considering labour supply and labour market behavior. Nations differ in the structure of their economies, in labour market institutions (labour legislation and industrial relations) and more generally, in their climate of human relations broadly considered. We might therefore expect different labour market outcomes in different countries. This paper will consider some differences and similarities in labour market behavior between Canada and the United States.

The comparison of these two countries over such a long period is subject

to data limitations. I have found, though, that some interesting, if straightforward, hypotheses do appear to gain support from the available materials.

## **2. Life Cycle Theory and Labour Supply**

Economists have long been interested in why labour supply varies with age. The standard analysis is in terms of a choice between income and leisure. The individual is posited to value both. Since taking more leisure is at the cost of earnings, a choice must be made. A higher price or opportunity cost of time is expected to discourage taking leisure. On the other hand, higher levels of income are expected to yield a greater demand for leisure. Since the wage rate is an (approximate) measure of the price of time as well as a principal determinant of the average person's income, changes in the wage rate, including those that occur over the life cycle, would be expected to play an important role in determining the age distribution of labour supply.

In the simplest theory, labour supply at each age is determined by the individual without regard to past or future concerns. For example, the labour supply of a thirty year old in 1980 would be determined by the wage rate available in that year, the wealth or nonlabour income that he might have, and other contemporary influences.

The effects of a high wage on labour supply are ambiguous in this theory, since a high wage both raises the opportunity cost of time (discouraging leisure) and increases the level of income (encouraging leisure). The net effect



simply depends on which effect is greater in practice; theory does not give us an answer. We do know that over the past 150 years real hourly wages rose and the average level of male labour supply fell, yielding the famous backward sloping supply curve of labour. But this historical data on national aggregates need not give us a good prediction of how labour supply will vary as an individual ages.

Moreover, a little reflection suggests that this simple theory will be too simple to apply to variations in labour supply with age: we know that individuals don't ignore their likely futures altogether. There are, further, obvious empirical examples that challenge this simple theory. Sixty-seven year olds don't supply as much labour as those thirty-five years old, even though their market wages are lower. Moreover, when we compare sixty-seven year olds today with thirty-five year olds thirty or forty years ago, when the younger workers had real wages comparable to those of older workers today, we find that the older workers are still less likely to be employed, or employed full-time. And, of course, children don't work in our societies. Teenagers, when they do work, typically put in fewer hours than adults despite their lower wages. Such examples are not consistent with a negative relationship between labour input and wages.

An alternative to this model is the 'life cycle theory' of labour supply.<sup>1</sup> Ghez and Becker pioneered in the development of this theory in their 1975 contribution, The Allocation of Time and Goods Over the Life Cycle. In their model<sup>2</sup>, a young person's lifetime wealth is given by the initial stock of wealth that the individual possesses plus the present value of all future income streams, including those from earnings. It is a perfect foresight model, in

which the individual can accurately predict these future events. On these assumptions, an individual's wealth does not vary over his lifetime. Year to year changes in hourly wages only represent differences in the price of time.

Individuals can also borrow as much as they like at a constant rate of interest and in any year work as many or as few hours as they like at the same hourly wage. The individual can then follow a life plan for supplying labour, borrowing, and savings. The purpose of this plan is to maximize lifetime utility, the present value of the utility gained in each year of adult life. Utility in each year is in turn a function of the leisure and consumption he will enjoy in that year. Under these assumptions, since wealth is constant and higher wages in a given year simply represents a higher price of time, the individual will reduce the amount of leisure and increase labour supply in that year. For a given individual, then, wages and labour supply will be positively correlated, *ceteris paribus*.

The theory does not predict a perfect match between wages and hours, though. On the one hand, the market rate of interest encourages individuals to work hard and save when they are young; on the other hand, a common preference by individuals for present over future satisfactions provides an inducement to borrow and take leisure when young. If the rate of interest is high relative to the way the individual discounts the future, he is expected to have a peak in hours of work somewhat earlier than the peak in his hourly earnings.

This theory makes some very strong assumptions. Skeptics can argue

that individuals have only a foggy idea of their longterm futures: health, longevity, macroeconomic disturbances, promotions and layoffs on the job, unemployment spells, and, last but not least in importance, the longterm trend in real hourly wages, are all important factors in determining labour market behavior. Yet they are difficult or impossible to forecast with any confidence. Moreover, individuals face credit constraints and cannot borrow as much as they like at any interest rate, let alone a constant rate. They also face constraints in the labour market. Many employers pay less to part-timers than to full-timers. On the other hand, the fatigue that comes with unusually long hours of work lowers productivity and so provides a disincentive to employers to schedule such hours at the going wage rate. Moreover, in the long run, an individual's wages are not only a function of initial endowments and current labour market conditions, but are also determined by past on-the-job training and other employment experience; those who withdraw from the labour market for years at a time typically find that their earnings are lower when they return. Finally, the majority of workers are employed at standard hours; in practice, this constrains the ability of younger, full-time workers to have very different hours schedules than do older, full-time workers.

Ghez and Becker did submit their theory to an empirical test, comparing the age distribution of hours per employed males with the age distribution of hourly wages, both for the year 1965. They found a very good fit. Both hours and wages followed an inverted U path. True, hours peaked several years before hourly wages. But their theory easily accommodated this difference; it would be predicted if individuals faced a rate of interest that exceeded their personal rate of time preference by a reasonable amount, leading them to

postpone taking leisure.

This was not a satisfactory test, though. Life cycle theory is a theory relevant to individuals, or to birth cohorts, not to age cross-sections. The latter can yield misleading results. An age cross section compares the labour supply of different cohorts at a moment in time. For example, the 1965 U.S. cross section included older workers who entered the labour force in 1920 or earlier as well as youths who entered as late as the current year. A more appropriate test would take a birth cohort -- a group that reached adulthood in a given year -- then examine the year-to-year changes in their labour supply and hourly earnings.

### **3. Empirical Data<sup>3</sup>**

#### **Age Cross Sections**

Canadian and United States data on hours, labour force participation, employment, and earnings over the past seventy-five years provide us with a rich source of information on this issue. True, there are gaps in data series, changes in the statistical definitions, and other practical problems. The data do, though, provide the basis for a number of straightforward observations.

We will first consider the data for males, then turn to a discussion of the labour supply of women.

When one looks at long-term data on the age cross-sections of male labour input per capita (defined here as the proportion of the group employed



times hours worked by those employed), we see broadly similar patterns in Canada and United States. (See Tables 1-4.) Data on child labour are not even collected, presumably because it has become so unusual. The labour of teenagers, 14-16 to 19, is reported and is relatively low.<sup>4</sup> Labour supply rises for those in their early twenties, and is typically at a maximum for those in their late thirties. Those in the 45-64 age group work less. Those over sixty-five supply much less labour than those 45-64. We thus obtain an inverted U in each age cross section.

These inverted U's do change their shape over time. The relative distribution of labour supply has become more peaked in both countries. Earlier withdrawals from the labour force and later entry by young people, usually associated with more years of schooling, together with continued heavy participation by primeaged males yields this result. (See Tables 6 and 8.)

When one looks at the age cross-sections of wages for males in the two countries over this period, a rather similar pattern is found. Hourly wages are very low for teenagers, then rise with age. The peak is usually in the late forties, somewhat later than the peak in labour supply. Moreover, there has not been much systematic change in the relative distribution of wages. There is, though, some tendency for wages to rise more rapidly with age in the past twenty years, very likely reflecting a greater reward for experience in the labour market.

When these numerous age cross sections of labour supply for Canada and the United States are juxtaposed with the comparable age cross sections of



wages, we will generally find results similar to those in the U.S. for 1965: there is an inverted U in both, with the peak in wages occurring a few years later than that in earnings. (See Figure 1.)

There is one important difference between the Canadian and United States data: the much higher level of Canadian unemployment over the past decade. Since persistent, long-term variations in unemployment are usually small, much less important than variations in hours or labour force participation rates, very longterm analyses of labour inputs typically do not emphasize them. However, the increase in Canadian unemployment over the past fifteen years has now introduced a persistent, significant wedge between labour force and employment rates. This has not, though, much influenced the relative distribution of labour input in the cross-section. There has been a substantial increase in the rate of unemployment among primeaged Canadian males, as well as higher rates among other age groups.

### Time Series

The level of the inverted U also changed over time, as the amount of labour per capita supplied by each major age group fell. In the earlier years, this is largely a result of reduced hours per employed male. In more recent years, declines in male labour input are almost entirely due to lower rates of labour force participation and, most recently in Canada, to higher rates of unemployment.

Hours reduction in Canada took a somewhat different course than in the United States. There was a sharp reduction in weekly hours from 1850 to 1950

in the United States, but very little reduction since (at least for primeaged males).<sup>5</sup> Hours reduction continued for a few years later in Canada. For example, the standard workweek in Canadian manufacturing fell from 50.3 in 1921 to 43.2 in 1950, but then dropped to 40.2 in 1965. But household data show little if any reduction in the past twenty years.<sup>6</sup>

Male labour force participation rates fell significantly in both countries. There has been a long-term downward trend in male labour force participation at every age group, but especially among younger and older workers -- teenagers, those 55-64, and those over 65. This downward trend has accelerated in recent decades, in the very years in which hours decline was moderated or ceased.

In Canada, the decline in male employment rates was significantly sharper than that in labour force participation, because of higher unemployment. Among males fifteen years and older, only 65 % were employed in 1995. Even in the primeaged group -- 35-44 years -- only 85 % were employed.

### **Cohort Analysis**

As noted above, life cycle theory is not a theory of age cross-sections, but of individuals as they age. Cohort data provide an approximate measure of the latter.<sup>7</sup>

In both countries, the labour supply of male workers actually declines more with age than is indicated in age cross-sections. (Compare Tables 9 and

10 with, respectively, Tables 2 and 4.) The basic reason for this difference is the downward time trend in male labour supply. Consider, for example, how inaccurate it would be to use cross-section of U.S. males in, say, 1970 to evaluate the life cycle of labour supply of man who is sixty-seven years old in that year. Census data indicate that a twenty-two year old in 1925 actually was likely to put in as much as ten more hours per week, on average, than did a twenty-two year old in 1970. Hence, an age cross section that compares twenty-two year olds in 1965 with sixty-five year olds in that year significantly underestimates the decline in labour supply with age that cohort actually experienced.

The cohort-cross section discrepancy is now modulated somewhat differently than in earlier years. In both Canada and the United States, there has been a sharp decline in the proportion males employed over fifty-five or sixty-five years of age. One result is that the discrepancy between cohort and cross-sectional data are much greater for these older groups.

For example, a twenty year old in the nineteen sixties would experience much more decline with age, once late middle age was reached, than would be predicted from a nineteen sixties cross-section. This was because the participation of workers over fifty-five years of age declined significantly in the 1965-1995 period.

But the labour inputs of primeaged workers, say, 25-44 years of age, in 1965 would not yield as poor forecast for the future labour input of our twenty year old; while participation did fall somewhat for the primeaged group, the

reduction was much more limited. And hours of work for this group fell very little. (The forecasting error would be somewhat larger for Canadian workers, because of the much larger increase in Canadian unemployment among this age group.)

The cross section-cohort differential followed a different pattern in earlier decades. From the nineteen twenties to the nineteen fifties, there were marked reductions in weekly hours of work in each age group, by as much as ten hours, as well as some reduction in the participation rates of older workers. This meant that a cross-sectional age distribution of labour input in, say, 1920 not only greatly exaggerated the input that a contemporary seventeen year old would supply in the last years of his working life, it also yielded substantial overestimates of his labour input in prime or middle age, say, at age thirty-seven in 1940, or at age forty-seven in 1950. (See Tables 2 and 4.)

### **The Relation Between Labour Input and Earnings**

The real hourly earnings of males quadrupled in both countries over the past seventy-five years. A steep upward time trend in real wages in the first part of this period, from 1920 to about 1970, introduces major differences between age cross section and cohort earnings data. When wages rise at 2.5% or more per year<sup>8</sup>, the average wage at the end of a fifty year working life will be more than triple the average wage at the beginning. Absent any changes in the age distribution of wages, the real hourly wage of a man in a given age group will then be more than three times as high in 1970 as in 1920. This rising trend yields a much more rapid increase in wages with age for a cohort than we see in the cross section. The cohort gains both from this trend and



from the benefits of the group's lifetime of job training and other useful work experience. We only see these latter effects in the cross section.

All this has important implications for the life cycle theory of labour supply set forth above. Labour supply has tended to decline with age, while real hourly wage in the 1920-1970 period increased with age. (Compare Figure 2 with Figure 1.) As a result, cohort data often demonstrate a negative relationship between labour supply and wage. For example, a young man entering the labour force in 1970 might achieve a four or five fold increase in his real wage over the next fifty years (due in part to improvements in his own skills and experience, in part to the upward national trend in real wages). Yet his labour input would decline by about eighty per cent. Even if we compare the earnings of a man in his early twenties with those he might earn thirty years or so later, in his fifties, we see a similar, if more moderate result: a decline in labour input despite a more than threefold increase in his wage.

These facts clearly invalidate the life cycle theory cited above. That theory would forecast that this early cohort would respond to rapidly rising wages by deferring participation until late in life. They would supply much more labour in their fifties than in their twenties, for example. Yet we observe the reverse.

A second test of the life cycle theory is provided by the dramatic change in real wage growth in the past twenty-five years, from rapid increase to stagnation or even reduction. If the theory were correct, and real wage variation played such an important role in determining the age distribution of



labour supply, a truly major change in real wage growth (and hence in the way in which wage varies with age for the average person) would be expected to produce comparably large scale changes in the life cycle of labour supply. Since the theory predicts that a sharp upward trend in wages will induce workers to supply more labour later in life, the elimination of that trend, and hence of the incentive to defer labour supply, would forecast a large shift towards supplying labour at earlier ages. But no such change is seen. There is simply a continuation of the moderate changes of the preceding ten or fifteen years (say, from 1960 to 1975), primarily lower rates of participation by workers under twenty-five years of age and by those in their later years. (See Tables 2, 4, 9 and 10.)

There has been a sharp reduction in labour input by primeaged males in Canada in recent years. But this development cannot be explained by the life cycle theory. That theory would instead predict a relative increase in the labour input of primeaged or younger workers. The more plausible explanation is simply the much higher unemployment rates of primeaged males.

We must conclude, then, that the life cycle theory of Ghez and Becker fails both tests. And recall that the simplest theory -- the one that ignores life cycle theory and assumes that individuals react simply to their current wages and other contemporary variables -- did not predict the data either. One might be tempted to concede that, since the cohort data consistently reflect neither positive nor negative associations between labour supply and wages, developing a theory that would explain life cycle variations in labour input is a hopeless task.

But we do observe strong regularities in the age cross sections, a consistently positive relationship between wage and labour supply in every year examined. The economist should not ignore such persistent regularities.

My own view is that 'society,' broadly conceived to include individuals, families, governments, and intermediary institutions such as unions and corporations, have policies that ensure that at a moment in time those who are at an age when their labour input would have the lowest net economic value can remain out of the labour force.<sup>9</sup> These groups include the old and the sick, the very young, and those in school (since their net value in the labour force, their earnings minus the value of their staying in school, would be low or even negative).

Individuals contribute to this result by saving for their old age. Even if we reject any notions of perfect foresight about future economic conditions we can still assume that every worker knows that eventually he will, if he avoids a premature death, grow old. Everyday observation of the elderly informs him that his work will then likely be less remunerative, or even impossible, and probably much more unpleasant.

In similar fashion, families know that keeping their children out of the full time labour force and in school will very likely benefit them in the labour market; for many years now, investment in education has provided a very good return.

Governments reinforce these efforts, by state pension systems, tax

subsidies to private pension systems, subsidized or free medical care for the elderly, and by child labour laws, compulsory education, and massive public spending on schools. Employers also help by putting aside a portion of compensation into pension funds. Unions bargain for better pensions and, in some instances, have established their own pension plans.

All these efforts seem to be reasonably well explained by assuming that we typically act as though contemporary economic and social conditions, as well as the biological realities of aging, will continue. This would not be the case, of course, during a period regarded as abnormal, such as a war or an economic recession, when most people might expect a return to more normal conditions. But it does apply under normal conditions.

It is hard to measure any effect of long-term expectations of wage trends.

#### **4. The Life Cycle of Female Labour Supply**

The analysis of the female life cycle of labour is more complicated. While males have (at least in past times) made a two way choice between paid work and leisure, the time of women is divided three ways, paid work, leisure, and household production.

Economists have argued that this tripartite division of time may yield a positive relation between wages and labour supply for women. A woman can substitute goods and services in the market for time in cooking, cleaning and other housework. (Unlike males, who, limited to an income-leisure choice,

could only increase their leisure by reducing their supply of labour to the market.) Higher wages facilitate this substitution: if a woman's wage is high, it takes her fewer hours of paid work to obtain a microwave oven. It is plausible, then, that she will respond to higher wages by reducing housework time while increasing market labour supply (without necessarily decreasing, and perhaps even increasing, her leisure time).

### **Empirical Data**

When we look at the data, we see that the period from 1920-1975 provides some support for this theory: as real hourly wages increase over time, aggregate female participation in the labour force also increases. Female labour force participation doubled in the United States. In Canada, participation rose even more rapidly.

Labour input per capita also rose for women in both countries. Declines in the workweek reduced growth somewhat, but there were still very substantial increases. (See Tables 2 and 4.)

Turning to age cross sections, we see long-term increases in participation for primeaged and middleaged women, though not for young women (who are now more likely to be in school) or for women over sixty-five years of age.

At the outset of our period, the age cross sections show a peak level of labour supply when women were in their early twenties. The participation of women twenty-five years of age or older was sharply lower. (See Tables 6 and 8.) Women employees commonly left the labour force when they married, or when their first child arrived. This pattern gradually changed. Consistent,



large increases are observed among those 25-64, with more moderate rises in the 20-24 year old group. In later years, increased numbers of women returned to the labour force when their children were grown. In the United States, by the mid-1950's, those 45-64 contributed more labour per capita than those in the prime 25-44 year group. In Canada, participation rates for the middleaged rose to approximate equality with those of the primeaged by the sixties. In the following years, the relative distribution continued to change as, first, more mothers of schoolage children, then mothers of preschool children entered the labour force. There was also some movement from part-time to full-time employment. The resulting increase in labour input by women in the 25-44 age group resulted in their participation again exceeding that of the middleaged in the seventies, and exceeding that of those 20-24 by the eighties.<sup>10</sup>

A comparison of male and female age profiles in Tables 6 and 8 indicates some important long-term changes in gender differences. These were substantial in 1920. While the male pattern was an inverted U shape, with peak participation occurring in the primeaged years, the labour supply of women peaked in their early twenties followed by a sharp decline in their late twenties and early thirties. The past seventy-five years has seen a gradual trend in the female pattern towards the male pattern.

There is a similar pattern of convergence in the level of male and female labour supplies. Tables 5 and 7 show that in each age category the ratio female to male labour input gradually rises towards unity. (Though a significant gap remains, especially in the older age categories.)



## **Female Cohort Behavior**

The data for female cohorts in the United States and Canada have much in common. In both countries we see that an upward trend over time in participation means that the age-labour supply relation is more positive in a cohort than that displayed in an age cross section. (Recall that the opposite differential is found in the data for males.)

For example, the Canadian age cross section for 1960 shows labour input falling off as a woman moves from prime age to middle age. In fact, though, a cohort entering the labour force at age 17 in 1960 would actually increase participation somewhat as they moved from prime age to middle age.

The accelerated rate of change in female participation in recent years yields a number of such results. Thus, while the Canadian cohort entering the labour force in 1920 or 1930 still found that their participation more or less steadily declined after their early twenties, those entering in 1950 would find that their participation fell as they moved from their early twenties to prime age, then rose as they moved into middle age. And those entering in 1960 would increase their labour supply as they moved from their twenties to their thirties. In the United States, the labour supply of women would continue through middle age.

## **Female Participation When Wage Growth Slowed**

The stagnation in wages over the past quarter century also provides a challenge to the conventional theory of female labour force participation: if higher real wages are responsible for increased female labour force

participation, why did female labour force participation rates increase even faster when wage growth was so slow? There are no definitive answers.<sup>11</sup>

Plausible, though partial, explanations include:

1. A substitution of female for male labour supply. Male wage growth fell to even lower levels than did that for females, yielding a significant increase in the ratio of female to male wages. An economic theory of family decision-making would predict some substitution of female for male labour supply to result.
2. A marked increase in employer demand for women. When there is a large shift in the ratio of two factors used in production, and this is accompanied by an increase in the relative price of the factor which is now being utilized at a relatively higher rate, a *prima facie* case can be made that the relative demand for this factor has increased.

Much more work is needed to resolve this issue.

## 5. Conclusions

1. The life cycle of working time has been remarkably similar in Canada and the United States.

2. At any given time, the age distribution of male labour supply is an inverted U. Over time, the peak has become more pronounced, as participation for young and old workers declined relative to those in their prime.

3. The life cycle of female labour supply has changed. In earlier years,

it reached a peak in the early twenties, then declined sharply. It has gradually become more similar to that of males.

4. The level of male labour supply has declined over time. In earlier years, this was largely a result of reductions in working hours. More recently, it has been due to declining labour force participation.

5. The labour supply of women has increased steadily, accelerating in recent years. Increases have largely been in the form of higher labour force participation.

6. Cohort data are a more appropriate measure of the life cycle of individual behavior than are cross-section data. But the cohort data show less regularity. The data are not consistent with two simple theories of cohort behavior, the life cycle theory put forward by Ghez and Becker and a theory that ignores all life cycle influences. Social interventions by governments, with support from corporations and unions, help to shape age cross sections, along with individual and family decisions. Their combined efforts do produce regularities, but in cross sections, not cohorts.

7. There are some interesting differences between Canada and the United States. The forty hour standard workweek appear to have been achieved a bit later in Canada. Female labour force participation was at a lower level in Canada at the outset of the period. In time, though, both hours and labour force participation came to approximate the United States level.

There has been a persistently higher unemployment rate in Canada in recent years. This may not reflect any differences in labour supply, but certainly does impact on the actual course of employment over the life cycle. There are also numerous, probably less important, differences, especially in the timing of change. (For example, the earlier increase in participation by middleaged women in the United States.)

Overall, though, the similarities far outweigh the differences.





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## NOTES

1. I am following Ghez and Becker in using this term to refer to decisionmaking over an entire life cycle, rather than to decisions over a shorter period of time, such as a business cycle. For interesting recent examples of the use of different life cycle analyses using Canadian data, see Joseph G. Altonji and John C. Ham, "Intertemporal Substitution, Exogeneity and Surprises: Estimating Life Cycle Models for Canada," Canadian Journal of Economics, February, 1990, pp. 1-43; Kevin T. Reilly, "Annual Hours and Weeks in a Life Cycle Labor Supply Model: Canadian Evidence on Male Behavior," Journal of Labor Economics, July, 1994, pp. 460-77; and A. L. Roble, L. Magee, and J.B. Burbridge, "Kernel Smoothed Consumption-Age Quantiles," Canadian Journal of Economics, August, 1992, pp. 669-80.
2. For a positive assessment of this approach, see M. Browning, A. Deaton, and M. Irish, "A Profitable Approach to Labor Supply and Commodity Demands Over the Life Cycle," Econometrica, May, 1985, pp. 503-44. See also Jose-Victor Rios-Rull, "Working in the Market, Working at Home, and the Acquisition of Skills: A General-Equilibrium Approach," American Economic Review, September, 1993, pp. 893-907.
3. Data for the United States from the Monthly Labor Review, various issues; Employment and Earnings, various issues; unpublished data from the United States Department of Labor; and Owen, The American Work Force Since 1920. Canadian data from Labour Force Annual Averages, various issues; Historical Labour Force Statistics, various issues; Historical Statistics of Canada (first and second editions); Canadian Censuses of 1921, 1931, 1941, 1951, 1961, 1971, 1981, and 1991; Hourly Data From the Survey of 1981 Work History; Benimadhu, Hours of Work: Trends and Attitudes in Canada; Podoluk, "Incomes of Canadians"; Rashid, "Seven Decades of Wage Change"; and Denton and Ostry, Historical Estimates of the Canadian Labour Force.
4. This group provides the most difficult measurement problems. Different age categories are used by censuses and surveys in different years; there is an important, though difficult to measure long term trend from full to part time employment as student enrollment increases; and the way in which government agencies have measured (or have not measured) the role of student employment has changed.
5. At least, as measured by household data. The establishment data collected by the United States Bureau of Labour Statistics indicate a sharper decline than do their household data, partly because of increased moonlighting -- measured in the latter but not the former series -- but also because of likely greater inaccuracy in the household data. Similar gaps between household and establishment data are seen in the Canadian statistics. Unfortunately data collected from establishments are not obtained in conjunction with questions on the age distribution of the establishment's employment.



6. Again, for primeaged males. Moreover, while the average changed little, there was an increase in the dispersion of hours. See Morissette and Sunter for an interesting discussion.

7. The census and labour force survey data used here are only imperfect measures of cohort behaviour. As they age, cohorts are reduced by death and emigration, increased in numbers by immigrants. If those who die, emigrate, or immigrate supply, on balance, more or less labour than those who remain of the original cohort, the results observed in these sources will only approximate actual cohort behavior.

8. A typical rate of change in that period.

9. The theory presented here only relates to age differences in wages and labour supply: society takes measures that enable those whose age reduces labour market productivity to withhold their labour services.

Even when age is a legitimating factor in a transfer scheme, as in state retirement plans, the system transfers funds largely within earnings classes. While the system takes more from current high earners, it also distributes more to past high earners (though some redistribution to low earners does occur).

More generally, Canadian and United States publics have more ambiguous attitudes towards other sources of wage differences and labour supply. (Compare the attitude towards those whose wage potential is limited by physical disability with the less generous view of able bodied but low skilled workers who respond to poor wage prospects by opting out of labour force activity and applying for welfare payments.)

10. Labour input of Canadian women did not rise quite as rapidly as did their labour supply, because of the increase in the past twenty years in the unemployment rate of primeaged women. The increase in the unemployment rate for women was less than the increase for males, however. The female unemployment rate exceeded the male in 1975, but was lower than the male rate in 1994.

11. The man-in-the-street answer is, of course, that it is more difficult now for a family to make do with just one earner. I.e., that there is a negative relation between wage and female labour force participation. But from, say, 1920 (or earlier) to 1970, the time series yield the opposite result.



**TABLES FOR OWEN: THE LIFE CYCLE OF  
WORKING TIME IN THE UNITED STATES AND  
CANADA**

TABLE 1

PROPORTION EMPLOYED  
(By age and sex)

## CANADA

## MALES

## FEMALES

	15-19	20-24	25-44	45-64	65& +	15-19	20-24	25-44	45-64	65& +
1995	39.5	66.5	83.3	71.4	9.8	40.0	63.4	70.6	53.1	3.2
1990	49.9	72.2	86.9	74.7	11.2	40.1	63.0	70.0	52.8	3.3
1985	42.5	69.9	86.1	75.2	12.1	48.8	68.9	71.8	50.1	3.7
1980	48.0	76.6	90.6	81.7	14.5	43.3	65.5	63.6	44.1	4.2
1975	46.2	76.1	91.4	83.6	17.5	44.2	65.2	57.9	41.9	4.3
1970	38.8	75.9	91.7	86.3	22.9	34.8	57.3	39.6	36.5	5.5
1965	41.1	84.2	94.1	88.4	26.8	36.3	52.6	33.0	33.7	6.7
1960	42.3	81.6	90.9	86.3	29.9	38.5	47.5	28.5	27.2	6.2
1955	51.6	87.2	93.4	88.0	32.8	40.4	46.1	24.1	19.4	4.3
1950	61.2	89.1	94.1	89.2	41.4	40.6	46.3	22.7	16.8	4.7
1946	67.3	85.2	93.7	91.1	49.0	46.3	47.9	23.5	15.7	5.6
1941	49.5	68.5	83.4	82.1	47.3	26.3	39.1	23.6	11.3	5.9
1931	55.9	75.0	86.4	85.0	56.6	27.6	41.0	20.7	9.6	6.4
1921	72.4	82.6	90.0	88.4	61.0	33.3	35.7	16.3	8.6	6.9

TABLE 2

LABOUR INPUT PER CAPITA  
(By age and sex)

## CANADA

	MALES					FEMALES				
	15-19	20-24	25-44	45-64	65&+	15-19	20-24	25-44	45-64	65&+
1995	8.6	23.1	33.6	28.1	3.2	7.4	18.6	22.2	16.5	0.7
1990	11.9	26.9	35.4	29.5	3.5	8.2	20.3	22.3	16.4	0.7
1985	10.5	25.9	34.6	29.5	3.8	10.4	21.9	22.2	15.0	0.9
1980	13.9	29.3	36.4	32.0	4.7	10.8	21.4	19.5	13.2	1.1
1975	14.1	29.1	37.0	33.3	6.1	11.8	21.6	17.9	13.0	1.2
1970	12.3	30.0	38.5	35.6	8.2	9.6	19.7	12.7	11.8	1.6
1965	13.7	35.1	41.6	38.4	10.1	10.6	19.1	11.1	11.4	2.1
1960	13.8	33.4	39.5	36.8	11.1	11.0	16.9	9.4	9.1	1.9
1955	17.1	36.3	41.2	38.2	12.4	11.7	16.7	8.1	6.6	1.4
1950	20.9	38.2	42.8	39.8	16.1	12.2	17.3	7.9	5.9	1.5
1945	24.1	38.2	44.5	42.5	19.9	14.5	18.6	8.5	5.7	1.9
1940	18.4	31.9	41.1	39.7	19.9	8.6	15.8	8.9	4.3	2.1
1930	21.5	36.1	44.1	42.7	24.7	9.3	17.2	8.1	3.8	2.3
1920	28.8	41.2	47.6	46.0	27.5	11.6	15.5	6.5	3.5	2.6

TABLE 3

PROPORTION EMPLOYED  
(By age and sex)

UNITED STATES

	MALES					FEMALES				
	15-19	20-24	25-44	45-64	65&+	15-19	20-24	25-44	45-64	65&+
1994	0.438	0.746	0.879	0.763	0.162	0.513	0.710	0.756	0.639	0.092
1993	0.422	0.738	0.876	0.762	0.151	0.412	0.644	0.706	0.596	0.079
1990	0.466	0.766	0.898	0.774	0.159	0.442	0.655	0.711	0.574	0.084
1986	0.457	0.763	0.890	0.760	0.154	0.436	0.649	0.678	0.519	0.072
1983	0.431	0.713	0.863	0.755	0.154	0.400	0.609	0.632	0.487	0.076
1980	0.496	0.753	0.900	0.793	0.185	0.440	0.618	0.612	0.489	0.078
1977	0.505	0.764	0.910	0.805	0.191	0.701	0.591	0.554	0.465	0.077
1970	0.472	0.783	0.937	0.872	0.258	0.580	0.532	0.446	0.477	0.094
1965	0.462	0.815	0.946	0.884	0.268	0.473	0.463	0.405	0.451	0.097
1960	0.480	0.812	0.933	0.880	0.312	0.476	0.421	0.378	0.426	0.105
1955	0.516	0.827	0.946	0.894	0.379	0.467	0.431	0.365	0.385	0.104
1950	0.543	0.809	0.930	0.880	0.435	0.462	0.428	0.346	0.317	0.094
1940	0.348	0.767	0.904	0.842	0.411	0.232	0.420	0.304	0.204	0.068
1930	0.426	0.788	0.902	0.858	0.532	0.278	0.385	0.248	0.184	0.082
1920	0.564	0.843	0.934	0.889	0.565	0.323	0.376	0.223	0.172	0.082

TABLE 4

LABOUR INPUT PER CAPITA  
(By age and sex)

	UNITED STATES					FEMALES				
	MALES									
	15-19	20-24	25-44	45-64	65&+	15-19	20-24	25-44	45-64	65&+
1954	11.43	28.50	38.74	33.08	4.94	11.95	24.07	27.96	23.49	2.40
1993	10.86	27.98	38.60	33.06	4.64	9.55	22.04	26.41	22.00	2.14
1990	12.67	29.65	39.66	33.39	4.95	10.82	23.00	26.48	20.94	2.27
1986	12.24	29.77	39.10	32.60	4.74	10.64	22.92	24.94	18.57	1.91
1983	11.33	27.10	37.21	32.09	4.82	9.63	20.88	22.64	17.24	2.01
1980	14.24	29.36	39.02	33.71	5.74	11.27	21.77	21.84	17.33	2.10
1977	14.73	30.19	39.86	34.66	5.83	18.22	20.73	19.55	16.46	2.07
1970	13.06	30.71	41.11	37.38	8.68	14.72	18.66	16.33	17.05	2.81
1965	13.29	34.16	42.81	38.97	9.58	12.87	17.08	14.52	16.75	3.01
1960	14.03	33.97	41.11	38.07	11.47	13.51	15.96	13.62	15.85	3.41
1955	17.44	35.15	42.21	38.97	14.86	15.94	16.46	13.72	14.26	3.71
1950	19.11	33.67	40.92	38.17	17.76	16.82	16.56	13.22	12.06	3.41
1940	14.66	32.98	40.42	37.08	17.66	10.11	17.26	11.02	8.37	2.81
1930	20.02	37.62	44.81	41.96	25.44	13.08	18.26	10.72	8.27	3.71
1920	28.67	43.54	50.20	47.04	29.23	15.82	17.56	10.12	8.08	3.91



TABLE 5

LABOUR INPUT PER CAPITA: FEMALE TO MALE RATIO  
(By age)

	CANADA				
	15-19	20-24	25-44	45-64	65 & +
1995	0.859	0.808	0.660	0.587	0.236
1990	0.686	0.755	0.631	0.557	0.212
1985	0.991	0.847	0.641	0.508	0.236
1980	0.780	0.730	0.536	0.413	0.235
1975	0.838	0.745	0.483	0.392	0.205
1970	0.786	0.656	0.330	0.331	0.201
1965	0.774	0.542	0.268	0.298	0.207
1960	0.797	0.505	0.239	0.246	0.173
1955	0.685	0.460	0.197	0.173	0.110
1951	0.581	0.452	0.184	0.147	0.094
1946	0.603	0.488	0.191	0.134	0.095
1941	0.466	0.496	0.216	0.108	0.104
1931	0.433	0.476	0.183	0.088	0.094
1921	0.402	0.376	0.139	0.076	0.094

TABLE 6

LABOUR INPUT PER CAPITA: RATIO TO AGE 25-44  
(By age and sex)

## CANADA

## MALES

## FEMALES

	15-19	20-24	25-44	45-64	65 & +	15-19	20-24	25-44	45-64	65 & +
1995	0.255	0.687	1.000	0.838	0.094	0.332	0.841	1.000	0.745	0.034
1990	0.337	0.759	1.000	0.834	0.099	0.366	0.908	1.000	0.735	0.033
1985	0.305	0.747	1.000	0.852	0.111	0.471	0.988	1.000	0.675	0.041
1980	0.381	0.803	1.000	0.879	0.129	0.554	1.094	1.000	0.678	0.056
1975	0.381	0.785	1.000	0.899	0.164	0.660	1.210	1.000	0.728	0.069
1970	0.318	0.781	1.000	0.924	0.213	0.759	1.553	1.000	0.929	0.130
1965	0.329	0.844	1.000	0.923	0.243	0.951	1.711	1.000	1.027	0.188
1960	0.350	0.847	1.000	0.933	0.281	1.168	1.791	1.000	0.960	0.203
1955	0.416	0.881	1.000	0.926	0.300	1.448	2.056	1.000	0.812	0.168
1951	0.489	0.893	1.000	0.931	0.376	1.543	2.189	1.000	0.745	0.192
1946	0.541	0.857	1.000	0.955	0.446	1.702	2.187	1.000	0.671	0.220
1941	0.446	0.775	1.000	0.967	0.484	0.963	1.779	1.000	0.482	0.233
1931	0.487	0.818	1.000	0.967	0.560	1.153	2.131	1.000	0.466	0.288
1921	0.606	0.866	1.000	0.966	0.580	1.758	2.348	1.000	0.530	0.394

TABLE 7

LABOUR INPUT PER CAPITA: FEMALE TO MALE RATIO  
(By age)

## UNITED STATES

	15-19	20-24	25-44	45-64	65 & +
1994	1.046	0.845	0.722	0.710	0.486
1993	0.880	0.788	0.684	0.665	0.461
1990	0.854	0.776	0.668	0.627	0.458
1986	0.869	0.770	0.638	0.570	0.403
1983	0.850	0.771	0.608	0.537	0.417
1980	0.791	0.741	0.560	0.514	0.366
1977	1.237	0.687	0.491	0.475	0.355
1970	1.127	0.608	0.397	0.456	0.323
1965	0.968	0.499	0.339	0.430	0.314
1960	0.963	0.470	0.331	0.416	0.297
1955	0.914	0.468	0.325	0.366	0.250
1950	0.880	0.492	0.323	0.316	0.192
1940	0.690	0.523	0.273	0.226	0.159
1930	0.653	0.485	0.239	0.197	0.146
1920	0.552	0.403	0.202	0.172	0.134

TABLE 8

LABOUR INPUT PER CAPITA: RATIO TO AGE 25-44  
(By age and sex)

## CANADA

## MALES

## FEMALES

		MALES				FEMALES					
		15-19	20-24	25-44	45-64	65& +	15-19	20-24	25-44	45-64	65& +
0.295	0.736	1.000	0.854	0.128	1994	0.427	0.861	1.000	0.840	0.086	
0.281	0.724	1.000	0.856	0.120	1993	0.362	0.834	1.000	0.833	0.081	
0.320	0.748	1.000	0.842	0.125	1990	0.409	0.868	1.000	0.791	0.086	
0.313	0.761	1.000	0.834	0.121	1986	0.427	0.919	1.000	0.744	0.077	
0.305	0.728	1.000	0.862	0.130	1983	0.425	0.922	1.000	0.761	0.089	
0.365	0.753	1.000	0.864	0.147	1980	0.516	0.997	1.000	0.793	0.096	
0.370	0.757	1.000	0.869	0.146	1977	0.932	1.060	1.000	0.842	0.106	
0.318	0.747	1.000	0.909	0.211	1970	0.901	1.143	1.000	1.044	0.172	
0.310	0.798	1.000	0.910	0.224	1965	0.886	1.175	1.000	1.153	0.207	
0.341	0.826	1.000	0.926	0.279	1960	0.992	1.172	1.000	1.164	0.250	
0.413	0.833	1.000	0.923	0.352	1955	1.162	1.200	1.000	1.039	0.270	
0.467	0.823	1.000	0.933	0.434	1950	1.272	1.253	1.000	0.912	0.258	
0.363	0.816	1.000	0.917	0.437	1940	0.918	1.566	1.000	0.760	0.255	
0.447	0.840	1.000	0.936	0.568	1930	1.220	1.703	1.000	0.772	0.346	
0.571	0.867	1.000	0.937	0.582	1920	1.564	1.736	1.000	0.798	0.386	

TABLE 9

LABOUR INPUT PER CAPITA: COHORT ANALYSIS  
(By age and sex)

## CANADA

Birth Year	MALES					FEMALES				
	15-19	20-24	25-44	45-64	65&+	15-19	20-24	25-44	45-64	65&+
1904	28.8	38.65	42.01	37.63	8.2	11.6	16.34	8.64	7.57	1.6
1914	21.5	33.99	43.46	37.28	4.7	9.3	16.50	8.14	11.57	1.1
1924	18.4	38.20	40.51	32.77	3.5	8.6	18.60	8.64	13.11	0.7
1934	20.9	35.72	40.35	29.49		12.2	16.72	11.75	15.56	
1944	13.8	34.10	36.78	28.10		11.1	19.18	18.54	16.50	



TABLE 10

LABOUR INPUT PER CAPITA: COHORT ANALYSIS  
(By age and sex)

UNITED STATES										
		MALES					FEMALES			
Birth Year	15-19	20-24	25-44	45-64	65& +	15-19	20-24	25-44	45-64	65& +
1903	28.7	40.6	41.7	38.6	8.7	15.8	17.9	10.9	14.9	2.8
1913	20.0	35.3	40.8	38.3	5.7	13.1	17.8	12.6	16.9	2.1
1923	14.7	33.3	41.8	34.7	5.0	10.1	16.9	13.7	16.5	2.3
1933	19.1	35.2	38.3	32.8		16.8	16.5	16.9	19.2	
1943	14.0	34.2	39.9	33.1		13.5	17.1	19.6	23.5	

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**A Comparative Analysis of Moonlighting and  
Related Policy Issues in Canada and the United States**

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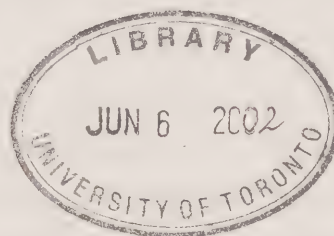
*A Comparative Analysis of Moonlighting and Related Policy Issues  
in Canada and the United States*

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## 1. *Introduction*

Moonlighting is a small but significant aspect of the labour market activity of North American workers. Changes in moonlighting, or multiple-job holding, have occurred along side many other labour markets transformations experienced by both Canada and the United States over the last few decades. An increased prevalence in moonlighting has not gone unnoticed by researchers on either side of the border. In Canada, Cohen (1994) and Webber (1989) have characterized moonlighters and have highlighted increases in the incidence of moonlighting among women, young persons, part-time primary job holders and service workers, while Pold (1995) has documented increases in the moonlighting rates among families. In the US, Stinson (1986 and 1990) and Sekscenski (1980) have described the strong increases in moonlighting for women, while Levenson (1995) has highlighted the increased prevalence of multiple-job holding for college-educated workers and, in particular, college-educated women.

Researchers in the US have also sought to examine the determinants of moonlighting, examining hypotheses such as primary job hours constraints, liquidity constraints and job heterogeneity, using econometric analysis (Shishko and Rostker, 1976; Krishnan, 1990; Lilja, 1991; Abdukadir, 1992; Conway and Kimmel, 1994; Kimmel and Conway, 1996; Paxson and Sicherman, 1996).

This paper is the first to analyze moonlighting in a comparative context across Canada and the United States. Because the US and Canada have inter-dependent economies with such broad similarities, the two countries serve as a useful basis for comparison. According to Card and Freeman (1993, p. 191), "few countries offer a more natural pairing of policies and institutions or for uncovering the reasons for differences in outcomes than the United States and Canada."

The paper begins by providing detailed descriptive evidence concerning various aspects of moonlighting behaviour in both countries. These descriptive analyses include an examination of differences across gender, age, education, marital status, occupation, industry, etc. Within this static comparison we are able to discuss reasons for moonlighting based on information reported by individual workers. We then seek further information regarding the determinants of moonlighting and the structure of primary job (PJ) and secondary job (SJ) wages by using regression analyses. We estimate separate PJ and SJ wage equations for each country which are used to construct predicted wages for use in a probit model for moonlighting.

In addition to the extensive static cross-country analysis, the paper also examines trends in moonlighting over time for both females and males in the two countries. We describe the trends in moonlighting rates across a variety of characteristics and highlight changes in the composition of moonlighters. Our analyses attempt to link the trends in moonlighting to other labour market changes and differing institutional structures in order to assess possible underlying causes related to the changes in multiple-job holding. For instance, do the changes in moonlighting reflect a desire for more flexibility by workers? Is it a response to increased economic insecurity and hardship? Is it driven by a changed work force comprised of more part-time workers, more self-employed, more service jobs, and increased female labour force participation, with the former changes resulting, in part, from globalization and increased technological change and competition? And, to what extent are the changes driven by increasing distortions which have affected the way in which firms demand bundles of labour?

The paper is structured as follows. Section 2 provides a static cross-country comparison of moonlighting with respect to a variety of characteristics. This section also provides an econometric analysis of the determinants of moonlighting. Section 3 analyzes the trends in moonlighting across the two countries and examines a range of possible reasons for changes in moonlighting. Section 4 concludes the paper.

## 2. *Current Comparison of Moonlighting Behaviour Between Canada and the US*

In this section of the paper, we examine the incidence and distribution of moonlighting across country and gender in 1991. We consider various demographic characteristics including age, education, marital status, and the presence of children in the household, and we use a sample of non-moonlighters as a basis for comparison. Next, we describe the extent to which moonlighters are self-employed or hold temporary or union jobs, and the incidence and distribution of moonlighting across occupations and industries. Also analyzed in this section are wages on both jobs and total hours worked. Then, we relate two basic motivations for moonlighting (primary job constraints and heterogeneous jobs) to reported reasons for taking a second job. Finally, we present multivariate analyses to explain the structure of primary and secondary job wages as well as the probability of moonlighting.

The United States data are drawn from the May Current Population Survey, which contains a special supplement with information on multiple jobs. The CPS is a randomly drawn US sample of households. Only those rotation groups eligible for the supplement are included in these analyses. And, only individuals between the ages of 17-64 are included in our sub-sample. In the 1991 data, the full sample is comprised of 14,727 workers, of whom 941 moonlight. Broken down by gender, the full sample includes 7,896 male workers and 6,831 female workers.

The Canadian data used in this section of the paper are drawn from the Survey of Work Arrangements (SWA) which is a supplement to the November 1991 Labour Force Survey (LFS). While the LFS does flag multiple job-holders, the SWA provides additional information on work patterns, primary job union membership, occupational and industrial distributions of secondary jobs, secondary job wages, and the reason for moonlighting. Certain data in the SWA are available only for paid employees and these cases are noted in our tables. Our sub-sample includes those individuals aged 17-64 and omits unpaid family workers. Thus, our Canadian sample contains 29,875 workers of which 13,500 are female and 16,375 are male. Among all workers, 1,606 individuals are multiple job-holders.

While both survey designs aim for the resulting samples to be purely random representations of the two countries' populations, both samples suffer from some systematic nonresponse and over/under representation of particular segments of the population. Therefore, all of the summary statistics presented in this paper are weighted.<sup>1</sup>

## 2.A Who Moonlights?

The incidence of moonlighting in Canada and the United States by different individual characteristics are given in Table 1.<sup>2</sup> Overall, US workers are more likely to moonlight than

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<sup>1</sup>The US CPS weight used is the multiple job holder (supplement) weight. This weight corrects for nonresponse in general, as well as nonresponse that varies systematically by class of worker.

<sup>2</sup>The discussion in this section will relate to data given in Tables 1, 2 and 3. Table 1 shows moonlighting rates; that is, the percentage of different groups of workers who moonlight. The numbers in Table 2 are distributions, showing the percentage of all moonlighters who fall in the given subcategory, defined by a characteristic. For example, Table 2 shows that 65.9 percent of all Canadian moonlighters are married. And, Table 3 is interpreted just like Table 2, except Table 3 focuses on employed non-moonlighters.



Canadian workers, at 6.01 percent in the US and 5.04 percent in Canada.<sup>3</sup> While in Canada, female workers have higher moonlighting rates than their male counterparts (5.31 percent versus 4.82 percent), the opposite is true in the US (5.34 percent versus 6.56 percent). Note, however, that females in Canada and the US moonlight at approximately the same rate. The US male moonlighting rate is 1.74 percentage points higher than the Canadian male rate, a 36 percent difference.

The moonlighting age profile also is different across the two countries. For male and female workers combined, Canadian moonlighting rates peak for the youngest workers while US moonlighting rates peak for the middle-aged workers (ages 25-44). The moonlighting rates for young workers (ages 17-24) are essentially identical across the two countries, at 5.4 percent. This pattern is altered when the sample is broken down by gender. Canadian male moonlighters are like their US male counterparts, moonlighting at the highest rates during the middle ages. It is the Canadian female moonlighters driving their aggregate age profile: they are most likely to moonlight while they are young. US female moonlighters follow the same age-moonlighting profile as their male counterparts, moonlighting at the highest rates during the middle ages. The differences across Canada and the US in the age profile of moonlighting is probably linked to the reasons for holding a second job and the way in which these two jobs are packaged. Both issues will be addressed in more detail later in the paper.

Further information regarding moonlighting patterns over the life cycle can be discerned from Table 2. The numbers in Table 2 represent the distribution of moonlighters across various characteristics.<sup>4</sup> Over half of all moonlighters are prime-aged workers, and in the US, this figure approaches two-thirds. This is probably due to the prevalence of this aged worker in the workforce, plus the competing financial pressures of home ownership and saving for children's college as well as retirement. The life cycle distribution of moonlighting across gender is quite

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<sup>3</sup>These rates differ from the rates implied by the raw data, but again, this is due to the weighting necessary to assure that the summary statistics reflect the populations in the two countries.

<sup>4</sup> For example, in Canada, 16.6 percent of all moonlighters are between the ages of 17 and 24 years.

similar for both countries. As is shown in Table 3, compared to non-moonlighters, US moonlighters are somewhat more likely to be between the ages of 25-44.

As seen in Table 1, for Canadian and US workers, male and female, the incidence of moonlighting rises with higher levels of education. For those with a university degree (16 or more years of education for US workers), 6.21 percent of Canadians and 8.04 percent of US workers moonlight. For lesser educated workers, moonlighting rates are below 4 percent in both countries. Comparing Tables 2 and 3, non-moonlighters are considerably more likely to have low levels of education compared to moonlighters. This implies that moonlighting is not mostly comprised of the most disadvantaged workers, contrary to what is often implied by the popular media. On the contrary, because of the rising marginal valuation of each additional foregone hour of leisure, if the substitution effect dominates then those who are most likely to moonlight, *ceteris paribus*, would be those with the relatively greatest wage opportunities on the second job. Additionally, higher educated workers are more likely to be salaried on their primary jobs rather than hourly paid, and so extra hours worked on the primary job will not increase earnings. Overall, then, moonlighting is undertaken by relatively higher-educated workers. This finding is consistent with Levenson, 1995.

One of the characteristics with the most significant differences in the incidence of moonlighting by gender is marital status. In particular, US females who are divorced, separated, or widowed (the Other marital status category) moonlight at a rate of 7.44 percent, higher than the 5.38 percent rate for like US male workers. No single marital status category for males has a moonlighting rate as high as for the Other females. In Canada, two marital status categories for females exhibit higher moonlighting rates than for any of the three marital status groups for the Canadian males. Females who have never married have a 6.09 percent incidence of moonlighting, while 5.59 percent of females who are divorced, separated, or widowed moonlight. The difference in moonlighting rates between the US and Canada for unmarried females is due in part to the US' less generous social safety net, which forces greater work effort on the part of single mothers. (Blank and Hanratty, 1993 and Card and Freeman, 1993.)

From Table 2, about two-thirds of moonlighters are married, reflecting the relatively high percentage of married workers in the general working population. In both Canada and the US,



male moonlighters are more likely to be married, at 66 percent for Canadians and 61 percent for the US. However, the gender differences are striking for the US, where 69 percent of male moonlighters are married but only 48 percent of female moonlighters are married. The extent to which these numbers are driven by overall labour market statistics can be seen in Table 3, where the distribution across marital status is quite similar to that found for the non-moonlighters. The only substantive difference is for females, where the marriage rate for employed non-moonlighters is 10 percent higher than the rate for moonlighters.

As is typical in most standard labour supply issues, the presence of young children (aged 0-5 years) is associated with less moonlighting for females but more moonlighting for males. That is, male workers with young children are more likely to moonlight than male workers in general, and the opposite is true for females. This pattern holds for both Canada and the US, although the gender pattern is stronger in the US. For men, the income effect of children is stronger but for females, the substitution effect is stronger, implying that the relative valuation of work and leisure causes women to work less when they have young children. Therefore, women with young children are less likely to moonlight as well. As seen in Table 2, Canadian male moonlighters are about 20 percent less likely to have young children than US male moonlighters, while Canadian female moonlighters are more likely to have young children than their US counterparts. Non-moonlighters (Table 3) are about equally as likely to have young children overall in the two countries, but there is more of a gender difference in the US, where female non-moonlighters are nearly 50 percent more likely to have young children than female moonlighters.<sup>5</sup>

Looking at marital status and the presence of young children combined (US numbers, not shown in the table), reveals that the bulk of the higher moonlighting rates for male workers with young children is associated with the higher moonlighting rates for married or once-married males. In fact, divorced fathers of young children moonlight at more than twice the rate of all workers, 12.88 percent. Clearly the financial pressures of alimony or single-parenting play an important role here. Relating marital status and the presence of young children for females in the

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<sup>5</sup>The distribution of moonlighting across characteristics broken down by marital status and gender are given in Table 4.

US, married women with young children have the lowest moonlighting rate (3.72 percent), while unmarried women without young children moonlight at the highest rate, nearly 8 percent.

Canadians who are self-employed are much more likely to moonlight than the typical Canadian worker. However, in the US, workers who are self-employed in their primary jobs are less likely to moonlight. The corresponding rates of moonlighting for those self-employed in their primary jobs are 6.6 percent for Canadian workers and 4.9 percent for US workers. Comparing moonlighters to non-moonlighters (Table 3), the difference across the two countries is striking. While US moonlighters are less likely to be self-employed than non-moonlighters, Canadian moonlighters are much more likely to be self-employed. This might reflect a demand for SJ flexibility that is not available to the Canadian worker in the formal labour market. Or, self-employment may be a means of avoiding taxes, a more serious concern in Canada than the US.

Workers in Canada who hold temporary primary jobs moonlight at a rate greater than the overall moonlighting rate, 7.12 percent versus 5.04 percent. And, female temporary workers are 50 percent more likely to moonlight than the typical female worker. Comparing moonlighters to non-moonlighters, moonlighters are considerably more likely to hold temporary primary jobs.

The patterns of moonlighting for those workers unionized on their primary jobs differs across Canada and the US. Unionized male workers are more likely to moonlight than all male workers, but this increased moonlighting incidence is only 0.07 percentage points for male workers in Canada, but equals a 0.91 point difference for US male workers. Canadian females who are unionized on their primary jobs have significantly lower moonlighting rates than the overall female rate, but the opposite is true for US females. This might reflect the differences in unionization rates and the types of workers unionized between Canada and the US. In our 1991 data, Canadian males and females were unionized at rates of 39.7 percent and 34.1 percent respectively. However, in the US, males and females were unionized at much lower rates, 18.5 percent and 14.9 percent respectively.

From Table 2, 33.3 percent of Canadian moonlighters and 20.4 percent of US moonlighters are unionized on their primary jobs. That is, Canadian moonlighters are more than 50 percent more likely than their US counterparts to be unionized. In Canada, male moonlighters are considerably more likely to be unionized than females, but the rates across gender in the US

are fairly similar. Compared to non-moonlighters (as seen in Table 3), the differences across gender for Canada persist. Canadian male workers who moonlight are more likely to be unionized than their non-moonlighting counterparts, but the opposite is true for females. The result for males is somewhat counterintuitive, given the greater than 20 percent boost to wages associated with holding a union job (Riddell, 1993). However, union workers are more likely to work full-time, and female moonlighters are less likely to combine a full-time with a second part-time job than males. For the US, unionization rates for moonlighters and non-moonlighters are fairly close, but like the Canadian males, moonlighters are more likely to be unionized.

As one might expect, moonlighting rates vary across occupation and industries.<sup>6</sup> In Canada, by far the highest moonlighting rate for both men and women is the Primary occupation (7.86 percent and 12.32 percent), which includes farming, forestry, fishing, and mining. Of course, relatively few workers overall are employed in this occupation. The managerial and professional technical occupation (referred to as Managerial in the tables) is the most common occupation for workers of both sexes in both countries. Male workers in this occupation are a bit more likely to moonlight than workers overall. However, Canadian female workers in the Managerial occupation are less likely to moonlight, while the rate for this occupation for US females is nearly identical to their overall moonlighting rate.

One of the occupations most frequently talked about in discussions of moonlighting is sales. But, see that only US males in sales moonlight at relatively high rates. Sales becomes more important as the occupation choice for the second job. Approximately 40 percent of female moonlighters in both countries hold second jobs in sales. For males, 37 percent and 25 percent respectively of moonlighters in Canada and the US moonlight in sales. A second occupation prevalent in moonlighting jobs is the Professional/Skilled occupation. And, a third of US male moonlighters are holding second jobs in Semi-skilled/Unskilled jobs.

Turning to PJ industries, relatively high moonlighting rates are seen in Agriculture and Community Services in all four samples. In fact, 45 percent of US females are employed in

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<sup>6</sup>US 3-digit industry and occupation SIC codes were matched to the broader categories reported in the Canadian data.



primary jobs in Community Services. (Community Services is a broadly-defined industry category that includes professional services and entertainment.) And, US males employed in the industry of Public Administration also moonlight at a high rate. For the second job, by far the most common industry is Services.

The final section in Table 2 shows the percentage of moonlighters whose second job occupation or industry are the same. Occupation switching between the PJ and SJ (seen as a relatively low percentage in the table) occurs with different occupations for men than women. For men employed in a clerical occupation in their second job, only about one-fourth were employed in the same PJ occupation. For women, only about one-fourth of those employed in a Semi-skilled/Unskilled occupation were employed in the same occupation in the primary job. For US females, about three-fourths of those employed in Sales and Service second jobs are occupation switchers. Industry switching is most prevalent for those employed in Retail Trade for the second job.

Information concerning wages on both jobs and total weekly hours is given in Table 2. On average, US male and female moonlighters work more total hours per week (at 57 and 45 total hours, respectively) than their Canadian counterparts (at 48 and 38 hours, respectively). These averages are nearly 10 hours/week higher than the average hours worked per week for non-moonlighters. Additionally, moonlighters have a much greater percentage working more than 50 hours per week than non-moonlighters. Approximately 50 percent of Canadian male moonlighters and two-third of US male moonlighters work more than 50 hours per week. Relatively few non-moonlighters work this many hours. These numbers suggest that many moonlighters face significant time pressures.

Male moonlighters earn on average \$15.90 per hour on the PJ in Canada and \$14.60 per hour on the PJ in the US.<sup>7</sup> Hourly wages for female moonlighters are nearly equal on average in Canada and the US, with Canadian moonlighters earning \$11.80 per hour on average and US moonlighters earning \$11.71. Compared to non-moonlighters, in three of the four samples earn

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<sup>7</sup>Wages are measured in Canadian dollars.

more per hour on average. Only US female moonlighters earn less per hour on their PJ than do non-moonlighters.

Secondary job wages are much higher on average for US males (\$16.97 per hour) than Canadian males (\$12.10), but the opposite is true for females. This might explain in part the higher moonlighting rate for males in the US. Canadian females earn \$12.10 per hour on their SJ while US females earn \$11.58 per hour. Surprisingly, Canadian males and females earn identical SJ hourly wages on average. However, as is seen from the SJ wage distribution, 32 percent of Canadian females are low wage (defined as a SJ wage less than \$7.00 per hour) while only 24 percent of Canadian males are low wage. In the US, 29 percent of male moonlighters are low wage workers, as opposed to 47 percent of US females. With respect to earnings capacity on both jobs, US females seem to be at the greatest disadvantage.

## 2.B. Why Moonlighters Take Second Jobs

Why do workers in the US and Canada moonlight? The evidence cited so far shows that there are many reasons, reflecting many factors including age, education, marital status, and household composition. As explained by Conway and Kimmel (1994), the reasons for multiple-job holding can be summarized as constraints on the primary job (insufficient hours or earnings) or heterogeneous jobs (different jobs provide different nonpecuniary benefits to the worker.) These sorts of reasons for moonlighting can be identified in both the Canadian and US data sources because both surveys give specific reasons for taking a second job that were reported by the individual workers. These findings are given in Table 5, and include the following responses: to meet regular household expenses, pay off debts, buy something special, save for the future, gain experience or build up a business, or enjoys the work of the second job.

While there are some similarities across the two countries, some differences can be seen, particularly in how the aggregate figures break down into their gender components. Combining the first and second categories gives the percentage of moonlighting attributable to financial hardship. Approximately 45 percent of Canadian moonlighters and 42 percent of US moonlighters report moonlighting due to financial hardship. And, Canadian male moonlighters are somewhat more likely than US male moonlighters to take a second job due to financial hardship, 45.6



percent versus 39.2 percent. The rates for females are similar across the two countries, and US women are more likely to moonlight due to financial hardship than US men. Combining the first four categories provides a more comprehensive picture of the percentage of moonlighters who are choosing to take a second job for financial reasons, or for PJ constraints, as alluded to earlier. Canadian males are more likely to moonlight for financial reasons than US males (62.9 percent versus 57 percent), but the opposite is true for women (61.2 percent versus 64.7 percent). However, both rates are fairly close.

The last two specific categories identify those moonlighters who have taken a second job because there is some characteristic of that second job that does not exist on the PJ.<sup>8</sup> From the two general moonlighting motivations listed earlier, this is the heterogeneous jobs motive. Canadian and US workers moonlight for this reason at fairly substantial rates, 25.8 percent for Canadians and 21.7 percent for US moonlighters. Breaking this down by gender reveals a more substantial discrepancy between female moonlighters, 27.3 percent for Canadians and 20.6 percent for US moonlighters. Overall, while financial motivations are most important in moonlighting, the heterogeneous jobs motive is important for a substantial percentage of individuals.

Reasons for moonlighting broken down by both gender and marital status are given in Table 6.<sup>9</sup> This table reveals perhaps the most striking finding of the data: for unmarried women who were once married (who we already know moonlight at relatively high rates), more than two-thirds of the time moonlighting reflects financial hardship. When the full scope of financial reasons are included, the percentages for females rise to 84.6 percent for Canadians and 86.4 percent for US moonlighters. These data reflect the difficulty with which women finance households with a single paycheck earned by a female worker, resulting from the lower wages earned by women on average. However, once-married women are not the only group hit so hard

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<sup>8</sup>This discussion ignores the final category of Other. It is not possible to assign these individuals to either of the two general categories with any certainty. In fact, a small percentage of these moonlighters are not truly holding a second job because they are changing jobs, and so probably only hold two jobs during a short overlapping time period.

<sup>9</sup>In the US side of the table, numbers for those divorced are listed separately from the more comprehensive Other category, strictly for the sake of comparison. The bulk of those in this Other category are indeed divorced, and while this level of detail is not available in the Canadian data, the same probably holds.

by financial hardship: in the US, nearly two-thirds of once-married men also moonlight due to financial hardship. And this percentage rises to 74.1 percent when all financial reasons are included. The reasons for the dramatic difference between Canadian and US men in this category are not clear: overall divorce rates in the US are higher than in Canada, and support systems for single mothers in the US are weaker than in Canada. But it also might be true that the US legal system is more successful in assuring that non-custodial fathers assume a financial role in the upbringing of their children. Married Canadian men are the marital group most likely to moonlight for financial reasons, at a rate of 65.2 percent. This is relatively high and much higher than the figure for the US. But, never-married individuals of either gender are also quite likely to moonlight due to financial reasons. It is also interesting to note that the only once-married individuals of either gender to moonlight at noticeable rates to save for the future are the US women, who do so at a rate of 10.8 percent. For the once-married Canadian women, moonlighting to save for the future is nearly nonexistent.

Married female moonlighters are the most likely of all the different gender and marital subgroups presented here to moonlight due to heterogeneous jobs. A third of Canadian and US women moonlight for this reason. Only 21.6 percent of Canadian men and 25.3 percent of US men moonlight for this reason. Given that well over half of primary jobs are full-time (at least for US moonlighters), taking a second job for such a "luxury" reason might be difficult to justify. There is probably a strong link between the percentage taking a second job to build up a business and self-employment; this will be examined in future research by the authors.

## 2.C Multivariate Analyses

In addition to the descriptive analyses using the summary statistics, we seek further information regarding moonlighting patterns and the structure of PJ and SJ wages using regression analyses. Previous econometric studies of moonlighting behaviour include Shishko and Rostker (1976), Krishnan (1990), Lilja (1991), Abdukadir (1992), Conway and Kimmel (1994), Kimmel and Conway (1996), and Paxson and Sicherman (1996). First, in order to determine what factors are important in determining the level of wages in each of the two jobs, we estimate Ordinary Least Squares wage equations for both the PJ and SJ wages. Because SJ wages are observed only

for those holding a secondary job, we include an econometric sample selection term to account for this selection on positive SJ wages in this equation. We refer to this term as Lambda, and it is the standard Heckman (1979) sample selection correction term.<sup>10</sup> The two wage equations are written out in summary form below.

PJ wage = (dummy variables for age categories; dummy variables for education categories; dummy variable for young children;<sup>11</sup> regional dummies; industry dummy variables).

SJ wage = (dummy variables for age categories; dummy variables for education categories; dummy variable for presence of young children;<sup>12</sup> regional dummies; lambda).

These specifications reflect a standard human capital model of wages, in which the level of education and years of experience (proxied by age in our data) contribute positively to wages. Additionally, in the regressions for females, an additional dummy variable for the presence of young children in the family is included as a proxy for intermittent work history (Blau, 1988). And, the regional dummies are included to control the effect of regional differences in labour market demand conditions. Industry dummy variables are included in the PJ wage equation but not the secondary wage equation because the industry of the SJ is not available for all workers, so the results could not be used to predict the SJ wage for non-moonlighters.

PJ and SJ wage equations are estimated separately by country and gender. Results from these regressions are given in Tables 7 and 8. Because the equations are estimated with the natural logarithm of the wage as the dependent variable, coefficient values reflect percentage returns to the different characteristics.<sup>13</sup> Additionally, for each categorical dummy variable, the

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<sup>10</sup>Lambda is constructed from the results of a reduced form probit in which the dependent variable takes on the value of one if the individual moonlights, and takes the value of zero otherwise. Any worker self-employed on the primary or secondary job is excluded from all these regression analyses.

<sup>11</sup>This variable is included just in the regressions for females.

<sup>12</sup>See previous footnote.

<sup>13</sup>Also, the reader will recall that the wages are measured in Canadian dollars, using the 1991 exchange rate. According to Card and Freeman (1993), using purchasing-power parity figures would yield similar results.



coefficient is interpreted in comparison to the excluded category. Only coefficients with statistical significance of 10 percent or greater are discussed in text.

Starting with the PJ wage equation, as expected, age is positively associated with wages across the board, with older workers receiving increasingly larger wage boosts. The one exception to this rule is US females, where the middle age category receives the highest wage boost. This could be due to the fact that entry level wages for female workers have been relatively higher in the past 20 years or so (thereby shifting up the entire wage profile for these workers), a wage increase not enjoyed by the older US female workers.

The wage returns to education rise with higher education levels, as predicted by human capital theory. For men, Canadians and US workers receive 12 percent and 24 percent wage boosts, respectively, for having finished high school. This is a wage premium relative to workers who have failed to complete high school. See that the returns to finishing high school for US males is twice as high as that for Canadian males. This reflects a fact of the US labour market that has contributed to growing wage inequality in the US. For female workers, the returns to completing a high school education for Canada and the US are 14 percent and 20 percent. In all cases, the wage return rises with the higher education levels. So, for males, having completed some post-secondary education is associated with a 21 percent and 35 percent return for Canadians and US workers, respectively. Those two returns are 22 percent and 34 percent for females. Finally, having finished a university degree (or 16 or more total years of education in the US) is associated with 44 percent and 62 percent returns for Canadian and US men, respectively, and 50 percent and 58 percent returns for women. In each case, the returns to the different level of education is higher in the US. The returns across gender are quite close, with the most noticeable being the returns to men and women in the US for having completed college. Here, men receive a 4 percent larger return than the women workers.

As predicted by theory, having young children (associated with a greater disrupted work history) has a negative impact on wages for both Canadian and US female workers. The negative impact is almost double for the US females, but the absolute magnitude in both cases is quite small. And, as expected, region of residence is important. Canadian workers living in Ontario

receive the highest wage return, as do workers living in the Northeast and the West in the US. Of course, differences in the cost of living across regions play a role here as well.

The overall explanatory power of the PJ wage equations is quite high in all four cases, with R-squareds ranging in value from 0.34 up to 0.44. The explanatory power of the SJ wage equations is much weaker, with R-squareds ranging in value from 0.14 to 0.28. And, fewer of the a priori hypotheses for the specific variables hold in this equation. There is a fairly strong return to age (the proxy for experience), but the additional proxy for experience for females (the dummy variable for the presence of young children) is not significant in either case. And, education is not very strongly related to wages for any of the four samples. For Canadians (both males and females), there is a significant return for having some post-secondary education as well as a college degree, with the females receiving the higher returns. For the US, the only case of a significant education coefficient is for females with a university degree. Here, the return is 46 percent, but not as large as for Canadian female moonlighters. While no US regions are significant, for Canadian males, living in Manitoba or Saskatchewan is associated with lower wages (relative to Ontario), as is living in the Atlantic Provinces or Alberta for females. The only sample for whom sample selection is significant is Canadian females. That is, for this group, the probability of moonlighting is significantly positively correlated with higher SJ wages.

Results from these two wage equations are used to construct predicted wages for use in a probit model for moonlighting. The probit equation is written out in summary form below.

Probability of moonlighting = (PJ wage; SJ wage; dummy variables for age categories; dummy variables for education categories; dummy variable for young children; total number of children; dummy variables for marital status).

The probit model transforms a discretely measured dependent variable (here, a 0-1 dummy variable equaling one for moonlighters) into a continuous probability.



The results for the probit model of moonlighting are given in Table 9. Probit coefficients are given, then probit derivatives. For the two wage measures, elasticities are also given.<sup>14</sup> *Ceteris paribus*, one would expect that higher primary job wages would be associated with a lower probability of moonlighting. Indeed, in each of the two cases in which the PJ wage is significant, it is significantly negative. For males in the US and in Canada, those with higher primary job wages are less likely to moonlight. The PJ wage elasticity is fairly large in both cases: -0.81 for males in Canada and -1.18 for males in the US. For females, both PJ wage coefficients are positive with very large standard errors.

As a standard wage employment effect, we would expect that the coefficient on the SJ wage would be positive. That is, we would expect those individuals with a higher predicted secondary job wage to be more likely to take a second job. This coefficient is negative and insignificant in three of four cases, but in the one case where it is significant, for females in Canada, the coefficient is positive. The corresponding SJ wage elasticity is 1.26.

For Canadian males, age is not significantly related to the probability of moonlighting. But for Canadian females, older workers are increasingly less likely to moonlight. (Recall that the coefficient is interpreted in relation to the excluded category, which is the youngest age group.) For workers in the US, the only significant relationship between age and the probability of moonlighting is found with females, who are less likely to moonlight if they are older than 45 years of age.

The coefficients for the education variables are interpreted relative to the excluded category of the lowest education level, fewer than 12 years of education. Having more education increases the probability of moonlighting for Canadian males and US males and females. Interestingly, having more education is not significantly related to increased moonlighting probabilities for Canadian females.

Having young children can be expected to have different effects on men than women, due to traditional family roles. We would expect fathers to be more likely to moonlight due to an income effect; that is, having young children increases the stresses on the family budget. For

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<sup>14</sup>Note that income is excluded because it is unavailable in the Canadian data.

women, we would expect that having young children would raise the opportunity cost of working, implying a substitution effect, therefore reducing the probability of moonlighting. The only case in which this expectation is upheld is for females in the US, where having young children significantly decreases the probability of holding a second job. But these expectations are not contradicted in any of the other cases, because the coefficients are not statistically significant. The number of children would be expected to have somewhat the same role in the moonlighting choice, with a less strong negative impact on females. The results show that having more children actually increases the probability of moonlighting for females in the US. This implies that for these women, while the substitution effect dominates in the case of young children, the income effect dominates for total children.

We already saw in the previous descriptive analyses that marital status is strongly linked to moonlighting behaviour. But, in a regression framework, we are able to determine the importance of marital status after controlling for the effect of other factors. Controlling these effects, the role that marital status plays in the moonlighting choices of women is still evident. For both Canadian and US females, being never-married or once-married both are significantly positively related to the probability of moonlighting. It is likely that some of this effect would have been reduced had income been included as a variable, but still the importance of marital status is clear.

## 2.D Review of 1991 Comparison

There are several findings of note in this section. Moonlighting is most prevalent among relatively higher educated workers, and unmarried females are most likely to moonlight. Also, the bulk of moonlighting is undertaken for financial reasons. There are two major differences between moonlighting in Canada and the US. First, US workers overall are about twenty percent more likely to moonlight than Canadian workers, while females in the two countries moonlight at comparable rates. Second, US moonlighters work on average more total hours per week than Canadian workers, but moonlighters in all cases work considerably more hours per week than non-moonlighters.

The wage regressions reveal that the structure of SJ wages is more ambiguous than PJ wages, because while the expected wage return to experience is found, no consistent SJ wage return to education can be seen. And, the moonlighting probit equation shows the importance of PJ wages in the moonlighting choice, with those males having higher PJ wages being less likely to moonlight. And, *ceteris paribus*, those with higher education levels are more likely to moonlight. Finally, unmarried females are more likely to moonlight as well.

### 3. *Moonlighting Trends*

Moonlighting rates in Canada and the US have risen over the last few decades in the midst of an increasingly changed work world. The purpose of this section of the paper is to examine and compare the trends in moonlighting rates across a variety of characteristics and to examine the changes in the composition of moonlighters. The latter part of this section attempts to link the trends in moonlighting to other labour market changes and labour related policies in order to assess possible causes of increased multiple-job holding. For instance, do the changes in moonlighting reflect the need for more flexibility by workers? Is it a response to economic insecurity and hardship? Is it driven by a re-shaping of our work force resulting from globalization, increased competitiveness, and increased female labour force participation? And, to what extent might the changes be driven by increasing distortions which are altering the way in which firms are demanding bundles of labour?

Before delving into the statistics, we provide a brief listing of general labour market changes that have occurred in Canada and the US over the last two decades. This brief summary serves as a backdrop upon which we will expand throughout our analysis. Canada and the US have both experienced increases in their employment ratios mainly as a result of increases in the labour market activity by women. Unemployment rates in the two countries were similar in the 1960s and 1970s but diverged after the 1981-82 recession as the rates in Canada remained relatively high and those in the US returned to lower levels. Work patterns have changed dramatically in both countries. Indeed, beyond changes in moonlighting both countries have experience increased part-time work, more temporary work, and increased self-employment. Workers, on average, have also suffered from stagnant real wages and increased earnings



polarization. Poverty rates have also increased, in particular for children. Indeed, income levels have also become more polarized although to a greater degree in the US as the Canadian social safety net cushioned changes in the incomes levels of many Canadians. The industrial areas in which people work have also changed: both countries have experienced a shift from the manufacturing sector to the service sector. Finally, the institutional structures within which employers and employees operate have also experienced change. For instance, in the US unionization rates and real minimum wages have fallen. In both countries the non-wage component of employee enumeration has increased as payroll taxes have risen and non-wage benefits play an increasingly important role in compensation.

Let us now turn our attention to moonlighting trends. Table 10 provides moonlighting rates over time across a variety of characteristics and by gender for both Canada and the US. The changes in the distribution of moonlighters are found in Table 11. The Canadian data for our trend analysis are drawn from the Survey of Work Arrangements for the year 1991 and the Labour Force Survey for the years 1981, 1985 and 1995. The US data for the years 1981, 1985, and 1991 are drawn from the May supplement of the Current Population Survey. Statistics for 1994 come from unpublished tables from the US Bureau of Labor Statistics. As in the previous section, we include in our sample individuals aged 17-64 and we omit unpaid family workers.

### 3.A Trend Statistics

Canada and the US have both experienced increases in their overall rates of moonlighting since the early 1980s, although to a greater extent in Canada (see Table 10 and Figure 1). In Canada, there has been roughly a 50 percent increase in the incidence of moonlighting from 3.38 percent in 1981 to 5.04 percent in 1991 and in the US the rate reached 6.01 percent in 1991, up from 4.62 percent ten years earlier. In the last few years the incidence of moonlighting has continued to climb steadily in Canada, reaching 5.47 percent in 1995, while it has leveled off in the US just under 6 percent.

By gender, we can see from Figure 2 that the moonlighting rate for women has increased dramatically in both countries. In fact, in the US it is the increasing female rate which has driven the overall increase in the incidence of moonlighting, as the male rate has been more or less flat

over the last two decades.<sup>15</sup> In 1991, the female moonlighting rates in Canada and the US were roughly equal at 5.3 percent, up by 2.29 and 1.17 percentage points from 1981, respectively. In Canada, the male moonlighting rate has been growing, albeit more slowly than the rate for women and hence the female rate surpassed the male rate by 1991. Indeed, between 1981 and 1995 the female moonlighting rate doubled in Canada. Furthermore, women now make up 50 percent of all moonlighters in Canada due both to their increasing moonlighting rates and increased employment ratios. In the US, over the 1980s the female share among moonlighters remained roughly constant at 40 percent but by 1994 women accounted for 46 percent of all moonlighters.

Striking differences in rate changes are also observed across age groups (see Table 10 and Figures 3, 4, and 5). In both countries moonlighting rates have increased dramatically for young persons. By 1991 in Canada, young persons had the highest moonlighting rate (5.42 percent) among all age categories. This rate increased to 7.3 percent in 1995 driven by an escalation in the moonlighting rate for young women to 8.63 percent. In the US, while the percentage increase in moonlighting rates was the highest for young persons, those aged 25-44 continued in 1991 to have the highest moonlighting rate among age categories at 6.57 percent. While by gender moonlighting rates for the young in the US increased more for males over the 1981-91 period, after 1991 the rate among young females shot up so dramatically that despite falling rates for young men in this short period, young persons in the US moonlighted at rates greater than any other age group by 1994. While the incidence of moonlighting increased so strongly for young workers in both countries, the share of young persons among moonlighters actually decreased over the same period due to a smaller share of youth workers and increasing youth unemployment.

In terms of education, university graduates in both countries continue to have the highest rates of moonlighting among all education categories. The differential in rates between those individuals with college degrees and those with slightly lower levels of education shrunk over the 1980s as the rate for individuals with some college education grew at a faster rate. By 1991, higher educated Canadian women moonlighted at rates greater than higher educated men, while

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<sup>15</sup>The male moonlighting rate in the US dipped somewhat in 1981 but otherwise remained fairly flat over the 1980s.



in the lower education categories male rates continued to dominate. For instance, in 1981 in Canada, university educated males moonlighted at rates 20 percent higher than university educated women, while by 1991 females with university education were moonlighting at rates 12 percent greater than those for men. In the US, men continued to moonlight at higher rates than their female counterparts in all education categories and the highest differential existed in 1991 with higher educated men moonlighting at rates on average one third higher than females. The moonlighting rate for university educated men had risen to over 8 percent in 1991.

In both countries, by 1991 the proportion of moonlighters with at least some post-secondary education was roughly 60 percent, and those with university degrees made up one quarter and one third of all moonlighters in Canada and the US, respectively. The largest changes in the distribution of education among moonlighters occurred in Canada where as a result of strong increases in moonlighting rates for higher educated females combined with an increasing share of such women in the work force, the proportion of Canadian female moonlighters with post-secondary education increased from approximately 35 percent in 1981 to reach 64 percent and 73 percent in 1991 and 1995, respectively. The percentage of male moonlighters in Canada with higher education was up over twenty percentage points (67 percent in 1995) due entirely to an increase in the proportion with some post-secondary education or diplomas and a decrease in male moonlighters with lower education levels.

In Canada, never-married individuals switched from having the lowest moonlighting rate (3.26 percent) among the marital status groups in 1981 to having the highest rate (5.11 percent), by a small margin, in 1991. By 1995 never married persons moonlighted at a rate of 6.31 percent versus 5.20 percent and 5.06 percent, respectively, for the married and other marital status groups whose rates had leveled off. This dramatic increase in rates for the never-married group was consistent across gender in Canada and particularly strong for never-married women (7.49 percent in 1995). These results are also consistent with the strong increases in moonlighting rates for young persons. In the US, the never married and other marital group experienced significant increases over the 1981-91 period with the other marital status recording the highest rate of all groups by 1991. However, by 1994 the US experienced a shift in the direction of Canada's experience where never married individuals emerged with the highest rates. Again this result was

consistent across gender. While the proportion of moonlighters who are married has declined in both countries, driven by declines in the proportion of married male moonlighters, married individuals still comprise the bulk (2/3) of all moonlighters.

The incidence of moonlighting for individuals with children aged 0-5 increased in Canada from 3.84 percent to 5.07 percent between 1981 and 1991 and reached 5.52 percent in 1995. Unfortunately, we do not have data on this characteristic for the US for the years prior to 1991. However, we should note that the Canadian rate, even in 1995, still remained lower than the 1991 US moonlighting rate of 6.26 percent for individuals with young children. Note that the US rate differs substantially by gender (7.89 percent for males versus 3.90 percent for females). There are also gender differences worth noting for Canada. In 1981 and 1985, men with young children moonlighted at rates greater than females with pre-schoolers, however by 1991 this trend had reversed itself (opposite to the relative rates by gender in the US in 1991). And, by 1995, women with children under the age of six were moonlighting at a rate of 5.59 percent in Canada. This suggests a reversal in the relative strength of the income and substitution effects for women in Canada.

Turning now to an examination of the changes in the hours moonlighters work, we see from Table 11 that the average total number of hours worked by moonlighters decreased over the 1980s by about 2 hours per week in Canada and by only half an hour in the US, remaining significantly higher in the US at 51.9 hours per week compared to an average of 43.3 hours per week in Canada. In the US, this overall change in hours has been driven by a fall in hours of work by women which counteracted the increase in hours by males. In Canada, quite the opposite has occurred with the overall change being driven by adjustments in hours worked by men; female moonlighters worked on average slightly higher hours per week reaching 39.2 hours per week in 1995, while males reduced their hours which stood at 44.8 by 1995. This downward trend in hours in Canada is driven by fewer moonlighters working in the high tail of the hours distribution and more moonlighters working part-time hours.

The incidence of moonlighting among those who hold a part-time primary job reached 10.69 percent in Canada in 1995, up from 6.83 percent in 1985. The percentage increase in moonlighting rates among this group was more than double the increase in the rate for those

holding full-time primary jobs which increased from 3.46 percent in 1985 to 4.34 percent in 1995. Further, by 1995 just over one third of all Canadian moonlighters held a primary job that was part-time. By gender, one half of female moonlighters held part-time primary jobs, while this number was 20 percent for male moonlighters. While 50 percent of female moonlighters held part-time primary jobs we can see from the distribution of hours that 25 percent remained part-time workers. This suggests that fully one quarter of female moonlighters may be holding multiple jobs in order to attain full-time weekly hours of work. On the other hand, the fact that one quarter of female moonlighters remain part-time workers even after holding a second job is quite astonishing.

In the US, the incidence of moonlighting in 1981 was roughly a percentage point higher (at 5.56 percent) for workers with part-time versus full-time primary jobs. By 1991, workers with a part-time primary job moonlighted at a rate of 7.37 percent versus 5.81 percent for those holding a full-time primary job. This increased gap, however, is significantly smaller than the gap in rates between these two groups for Canada. However, similar to Canada, significant gender differences continue to exist; in 1991, the moonlighting rate for workers with a part-time primary job was 7.89 percent for women versus 6.44 percent for men. The proportion of moonlighters who hold a part-time primary job in the US rose only slightly over the 1980s (16 percent in 1991) and reached 22.6 percent in 1994. Indeed, US moonlighters are much more likely to be "job-packaging" than their Canadian counterparts who are increasingly becoming multiple-job holders as opposed to the traditional notion of moonlighters.

The incidence of moonlighting among the self-employed has risen in both countries; remaining significantly above the average rates in Canada and staying below the average rates in the US. While the moonlighting rate for self-employed individuals remains below the average rate in the US, this group experienced an above average percentage increase in rates. In Canada, the moonlighting rate for "own-account" self-employed reached 7.80 percent in 1995, driven by a dramatic increase in the rate among females which climbed over 9 percent in the 1990s.

Turning now to an examination of moonlighting by industry and occupation we would like to highlight several interesting trends. Among industrial groups, agriculture has traditionally had the highest moonlighting rates, while the majority of those who moonlight work in the service



sector. In Canada, the agricultural industry continued to have the highest moonlighting rates (for both genders) though the gap with respect to the rates for the service industry has narrowed. In fact, over the 1980s, the rates of moonlighting in the service sector rose significantly in both countries. In particular for Canada, strong increases occurred for males over the 1981-91 period in the business service sector and more recently rates in the personal service sector rose from 2.64 percent in 1991 to 6.23 percent in 1995. The rate among male community service sector workers leveled off in the last few years at a rate of 8.36 percent which approached the agricultural rate of 9.16 percent, the highest rate among sectors in 1995 for men. In the US, the increase in moonlighting rates experienced in the service industry was so large that by 1991, workers in community services moonlighted at a rate of 7.59 percent, the highest among all industries. This trend was driven by the increase in male moonlighting rates in this sector to 9.91 percent. US males working in the business service industry also experienced a dramatic increase in the incidence of moonlighting as rates rose from 3.40 percent in 1981 to 6.52 percent in 1991.

Unlike their US male counterparts, women in the agriculture industry in the US had actually moonlighted at rates below women in the service sector in 1981, but by 1991 this fact was reversed with a 4.5 percentage point increase in the incidence of moonlighting in the female agricultural sector. Canadian women also experienced dramatic increases in moonlighting rates in the agricultural sector with rates doubling from 1981 to 1991 to reach 8.53 percent and then rising to 11.48 percent by 1995. In terms of the distribution of female moonlighters across industries, the most significant change was reflected in a further increase in the proportion of those working in the already well represented service sectors.

In terms of occupational status, managerial, service and primary occupations have consistently had above average moonlighting rates since 1981. Consistent with the high agricultural sector moonlighting rates reported above for Canada, both men and women working in primary occupations have continued to have the highest moonlighting rates across all occupational groups in Canada. While in 1981, managerial occupations scored the second highest moonlighting rates for both men and women in Canada (though in absolute terms the rate for men was substantially higher than that for women), the rate for females in managerial positions increased so dramatically that it surpassed the rate for their male counterparts in this occupation

by 1995. Indeed, the incidence for moonlighting among females managers rose from 3.73 percent in 1981 to 6.92 percent in 1995 and, by 1995 the proportion of female moonlighters in managerial occupations represented 44 percent, up from a share of 32 percent in 1981.

In the US, managers held the highest moonlighting rates at 5.95 percent in 1981, but by 1991 the rate for service workers had increased to reach 7.35 percent, becoming the highest rate across all occupations in the US. This change was driven by further increases in the already high service rate for male workers to 9.84 percent. While in 1981 females in managerial positions in the US had particularly high rates of moonlighting, by 1991 the rates for those in primary occupations had increased 5 full percentage points to reach 8.45 percent which, similar to their Canadian female counterparts, was the highest rate across all occupations groups in that year.

### 3.B Explanations for the Trends

Having described the overall changes in the rates of moonlighting in both Canada and the US noting particularly high rates of increases for certain sub-groups of the population such as women, never-married individuals and young persons, the remainder of this section of the paper will now try to assess to what these changes in moonlighting can be attributed. As noted earlier, there may be many contributing factors. Does the increase in moonlighting reflect choices being made by those supplying labour in terms of desired flexibility? Is it a reaction by workers to increased economic insecurity and hardship? Is it driven by a change in the composition of the work force such as increased female labour force participation, more self-employed, more service jobs, and more part-time work, with the latter changes resulting in part from increased technological change, globalization, and competition? And finally, to what degree does it reflect a new equilibrium resulting from changes that have occurred squarely on the demand side by firms as a result of distortions causing changes in the way in which they are demanding bundles of labour? Thus, we will examine the potential reasons for changes in moonlighting along a variety of dimensions which include: worker flexibility, economic insecurity and hardship, composition of the workforce, and demand-side factors.



### 3.B.i Worker Flexibility

The desire by workers for increased flexibility in order to combine work with other responsibilities may increasingly be being achieved by piecing together multiple jobs. Flexibility is no doubt becoming an increasing concern: "Flexible working-time arrangements often offer workers opportunities to carry out responsibilities in ways that better meet today's standards of fairness and equity within the family." (Human Resources Development Canada, 1994, p.9) In particular, women may also be increasingly packaging their work hours differently in order to juggle family responsibilities such as child care.

Indeed, this would provide an explanation for the substantial increases in moonlighting rates by women and, in particular, by those holding two part-time jobs. However, recall that relative to Canada, US female moonlighters are more like their male counterparts in terms of adding a part-time secondary job to a full-time primary job and hence job packaging.

The moonlighting rates of women with young children have steadily grown in Canada since 1981. Current research in Canada which examines the relationship between non-standard jobs and child care arrangements shows that the use of multiple child care arrangements by mothers who moonlight is substantially higher relative to those working mothers holding "standard" jobs (Powell, 1996). While we cannot say anything about the causation of this relationship, the concern which arises here is the degree to which children are negatively affected by the instability inherent in being moved from arrangement to arrangement.

A preference for flexibility may also be required increasingly among students who hold multiple part-time jobs to fit their school schedules and who have been facing substantial increases in tuition costs.

### 3.B.ii Economic Insecurity and Hardship

Economic insecurity has increasingly been described as the current landscape in which workers find themselves participating. "In today's economy the buoyant optimism of the 1950s and 1960s is missing. The result is a sense of insecurity that is especially harsh in the modern workplace—whether it is experienced in the corporate boardroom, in the managerial office, or on the plant floor." (Human Resources Development Canada, 1994, p.8) In the face of increased

economic insecurity workers may well be more willing to trade-off on leisure. Further, real earnings in both countries have stagnated requiring increased work efforts to maintain stable standards of living, if not to avoid poverty.

Unemployment rates in Canada have remained relatively high since the 1981-82 recession. While the US unemployment rates have diverged downwards away from the Canadian rates, employment ratios in the two countries have remained fairly similar (Card and Riddell, 1993). The duration of unemployment spells in both countries has increased over the last few decades adding to the fear of unemployment (Human Resources Development Canada, 1995; Layard et al, 1991; Horrigan, 1987).

Growing economic insecurity in the US has no doubt been fueled by increased polarization of income and increased poverty rates over the last decade. (Danziger and Gottschalk, 1995.) Beach and Slotsve (1996) show that family income polarization in Canada did not increase over the last two decades. This is due the pooling effects of dual earners, relatively small increases in earnings inequality and Canada's strong social safety net. Indeed, in terms of the lower tail of the income distribution, Blank and Hanratty (1993, p.219), conclude that "poverty among both single-parent and two-parent families would decline dramatically if the United States adopted the average Canadian antipoverty transfer program."

Beach and Slotsve (1996) have provided an objective measure for Canada which shows that the overall probability of falling into a lower income bracket has decreased over time and how far one would fall, given a fall, has also decreased. At the same time, however, the authors also note that income gains and losses were not experienced evenly over different parts of the population. Young men and women experienced real income losses in Canada over the 1980s, while the largest increases in income were secured by older income recipients and university educated persons.

Economic hardship in North America has also increased among workers who have been able to secure jobs. Real earnings have stagnated in Canada. Real earnings of young men have fallen and those of young women have just remained stable, while older age group have enjoyed slow but positive real wage growth (Human Resources Development Canada, 1995). Changes in earnings polarization in Canada has also differed by gender; earnings polarization has increased

for males, while it has decreased for females mainly due to an increase in full-time female workers (Beach and Slotsve, 1996). In the US, real wages have also been stagnate through out the 1980s and earnings polarization has increased to a much greater extent compared to Canada (Danziger and Gottschalk, 1995; and Mishel and Bernstein, 1994).

Canada and the US have also experienced increases in the polarization of hours of work for all workers, although mean hours per week have remained fairly stable. (Sunter and Morissette, 1994; US SOURCE pending). Indeed, not only are the increases in moonlighting rates contributing to the polarization of hours at the upper tail of the distribution, but non-moonlighters are also increasingly working longer hours, no doubt in an attempt to recoup earnings.

Institutional factors such as unionization and minimum wages have played a part in the changes that have occurred. The unionization rate in Canada has remained stable. In the US, decreased unionization and the fall in real minimum wages have contributed to the increase in earnings polarization (Riddell, 1993).<sup>16</sup>

Lemieux (1993) shows that the presence of unions in both countries reduces overall wage variation for men. He also estimates that the difference in unionization between the two countries explains 40 percent of the Canada-US difference in wage inequality. Further, Kuhn (1996, p. 25) notes that "these policies [relatively high unionization rates and the maintenance of minimum wage standards] may both have mitigated the amount of wage polarization that would otherwise have occurred in Canada, and may be responsible for polarization taking the form of increased long-term unemployment and greater age, or generation gap in Canada rather than the increase in the working poor population seen in the US."

With respect to higher educated earners, Freedman and Needles (1993) reported substantially higher increases in college-high school wage differentials for the US versus Canada, attributable primarily to the faster relative growth in the number of university graduates in Canada. However, although US college graduates did experience relative wage gains and real wage growth throughout the 1980s, "older, white-collar workers were considerably more at risk

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<sup>16</sup>Legislation to raise the minimum wage in the US is currently pending.



of displacement [in 1991 compared to 1981] ... job displacement rates rose for more educated workers [and] these changes in the incidence of job displacement may be a reason for the reports of heightened anxiety regarding job loss." (US Council of Economic Advisors, 1996, p.9)

Thus, mounting economic insecurity, particularly for unmarried individuals, coupled with decreasing, if not stagnant, real wages for young persons provides a direct impetus for the dramatic increase in moonlighting rates that have occurred among these groups in North America. At the same time, it is not surprising that an already high rate of moonlighting among post-secondary educated persons has continued to climb as economic insecurity spreads upwards through the ranks.

### 3.B.iii Composition of the Workforce

The composition of the work force as a whole has changed significantly in both Canada and the US in response to factors such as technological change, globalization and increased competitiveness, and increased labour force participation by women. Indeed, an increase in the composition in the work force among those groups who have traditionally had relatively high rates of moonlighting or for those who have experienced the strongest increases in moonlighting will serve to push the overall moonlighting rate upwards. More service jobs, more part-time workers, more self-employed workers, and more working women all fit this description.

Indeed, both Canada and the US have experienced significant increases in labour force participation by women over the last few decades. On top of strong increases in the 1950s, 60s and 70s, employment among women has continued to rise since the early 1980s. In Canada, data from the Labour Force Survey show that the employment ratio for all women rose from 48.9 percent in 1981 to 52.8 percent in 1991. This rate has leveled off in the 1990s, equalling 52.1 percent for 1995. Women in their prime working years (aged 25-44) experienced a ten percentage point increase in the employment rate over the period 1981-91, reaching a rate of 70.7 percent in 1991. In the US, the employment ratio of women rose from 47.7 percent in 1980 to 54.4 percent in 1990. By 1994 this rate had increased just slightly up to 55.3 percent.

In terms of changes in job types, the Economic Council of Canada (1990) reported that 44 percent of all new jobs created between 1981 and 1989 were short-term or part-time jobs. More

recent evidence from Canada (Human Resources Development Canada, 1994, 1995; Pold, 1994; Krahn, 1995; Nakamura, 1995) has confirmed an increasing trend of non-standard work in the form of part-time jobs, temporary employment, and self-employment.

In particular, over the period 1975-1993 in Canada, the number of part-time jobs increased at an annual rate of 4.5 percent, while full-time jobs increased by only 1.2 percent annually (Pold, 1994). Evidence from the US shows that while part-time employment increased somewhat since 1980, the rate of involuntary part-time employment has risen by 45 percent over the period 1979-1993 (Houseman, 1995). Houseman notes that these data suggest that the changes in part-time jobs are demand driven. Indeed, increasing moonlighters with part-time primary jobs, coupled with the dramatic increases described for such jobs, clearly contributes to the overall increase in rates for Canada. This is true to a lesser extent in the US.

Indeed, firms have changed their hiring practices in response to changes such as globalization and increased competition. The 1994 (Canadian) Report of the Advisory Group on Working Time and the Distribution of Work highlights the move by firms to hire "just-in-time workers" to meet "just-in-time" production. Based on research from Statistics Canada, Human Resources Development Canada (1995) reports that the number of jobs lasting fewer than six months has increased significantly over the last fifteen years. Recall that evidence available for Canada in 1991 showed that temporary workers moonlight at above average rates. In the US, evidence from the Consumer Expenditures Survey show that in 1982, 0.47 percent of the non-farm payroll was in temporary help and by 1995 this figure had risen to 1.83 percent (Unpublished document from the BLS).

In both countries we have witnessed a strong shift from the manufacturing to service industries. According to Houseman (1995), the percentage of employment in manufacturing has declined steadily from 28.7 percent in 1969 to 16.2 percent in 1993. And, the percentage in services rose from 15.8 percent to 27.4 percent over the same time period. In particular, we have witnessed strong growth in knowledge intensive industries (Human Resources Development Canada, 1995). "With globalization and the knowledge/information, the world is in the throes of one of its epic transformations. The information revolution will have impacts on the role of human capital not unlike the impact of the industrial revolution on the role of physical capital."



(Courchene, 1994, p.232). Not only has there been an industrial shift in North America, the now increased service sector has also experienced strong growth in moonlighting rates.

### 3.B.iv Demand-side factors

While, as described above, global pressures and perhaps, put quite simply, the fight for survival among firms has contributed to changes in their demand for labour, firms' hiring practices may also be being distorted increasingly due to the differential application of payroll taxes and benefit packages to different types of employees, such as part-time versus full-time workers or contract versus paid employees. Indeed, while firms may have a variety of reasons for employing part-time workers, "to that list any additional factor which alters the relative cost of part-time vis-a-vis full-time employees...[and]...while these reasons may be less important in determining the level of part-time hiring, they could be much more significant in explaining *changes* in the level of such hiring" (Gallaway, 1995, p.309)

Kuhn (1996), in his analysis of earnings polarization, refers to these types of changes in firms' behaviour as changes in "firms' human relations practices" highlighting that they consist of extensive contracting out and the use of temporary and part-time workers while keeping only a small core set of full-time employees. Noting the lack of empirical evidence, he poses the question of the degree to which such changes contribute to increased earnings polarization. If, as suggested here, such changes are contributing to increased multiple-job holding then we may well expect that, in the aggregate, potential effects on earnings polarization would be dampened.

In Canada, employer payroll taxes such as unemployment insurance are payable by firms only on hours of work above 15 hours per week providing an incentive to offer part-time versus full-time jobs, all else being constant.<sup>17</sup> In addition, this tax is not applicable for self-employed workers, and hence those hired on contract. Occupational pensions and other benefit packages also drive a wedge in the relative cost of part-time versus full-time employees, and paid versus contract workers. In the US, differential costs associated with hiring full-time versus part-time

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<sup>17</sup>Note that legislation was passed on May 14th 1996 in Canada which removes the differential treatment of workers based on hours worked within the unemployment insurance system.

employees relate mainly to health insurance benefits and pensions. In 1993 "[a] much higher proportion of full-time employees received employment-based health insurance coverage directly (61.2 percent)...from an employer than did part-time employees (16.4 percent)" (Snider, 1995, p. 243). With respect to pensions, "[f]ifty-eight percent of full-time employees reported that their employer or union had a pension or other retirement plan (other than Social Security) for employees, [while] thirty percent of part-time employees reported such coverage...although coverage does not necessarily denote eligibility for coverage." (Snider, 1995, p. 245.)

These non-wage labour costs have been on the rise in both Canada and the US. Payroll taxes (including UI, CPP, worker's compensation, and other health and education taxes) have increased substantially in Canada over the last two decades (Abbott, Beach, Lin, and Picot, 1996). In the US, "[i]n 1973, fringe benefits accounted for 12.82 percent of all employee compensation, and...for 1993...they account for 17.81 percent of compensation—an almost forty percent increase in the relative importance of fringe benefits" (Gallaway, 1995, p. 309)

Empirical evidence on the degree to which firms change the way in which they demand bundles of labour due to relative price distortions such as those noted above is sparse. Gallaway (1995) provides empirical evidence for the US on the impact of fringe benefits on the demand for part-time employees and the volume of involuntary part-time work. His results show that "[f]ringe benefits have a powerful significant effect on part-time employment...[a] one percentage point increase in fringes as a percent of employee compensation increases the percent involuntary part-time employed by 0.57 percentage points" (Gallaway, 1995, p. 312).

Abbott, Beach, Lin, and Picot (1996) have just recently provided evidence on the impact of payroll taxes in Canada on employment. Their results show that higher payroll taxes have dis-employment effects on paid workers. Their particular study does not distinguish between part-time and full-time employment, however their results do have implications regarding the differential behaviour by firms with respect to other aspects of labour demand. Their results are consistent with the hypothesis that increasing payroll taxes lead firms to shift their labour demand from paid employees towards contracting out.

In summary, it is clearly difficult to compartmentalize neatly the changes in moonlighting into a specific set of causal relationships. Further, the inter-relatedness of the possible

explanations only serves to muddy the waters. However, it is clear that both Canada and the United States have experienced dramatic labour market and more general economic changes which in a variety of ways support each of the reasons posited as possible explanations for the changes in moonlighting.

Finally, we think that several policy concerns can be drawn from the analysis which should not go unnoticed. We would like to highlight the following:

- As the relatively-high paying low-skilled manufacturing jobs which many have depended upon in the past disappear and as we move to more knowledge-intensive industries, moonlighting rates are likely to continue to increase across a broad spectrum of skill sets. In this context, the acquisition of human capital becomes more important—something which governments must take note. Indeed, both Canada's and the United States' relative position in the world will increasingly depend on their commitment to human capital development.
- As women increasingly work in two part-time jobs acquiring full-time hours of work we must be wary of reporting full-time/part-time hours statistics rather than full-time/part-time job statistics. Indeed, by reporting the former we may be masking the work situation of an increasing proportion of working women who, while working full-time hours, do not receive the benefits usually associated with full-time work, such as health benefits, pensions, and, training, just to name a few.
- Lack of availability of high quality "flexible" child care.
- Existence of legislation that introduces distortions in the way in which firms demand bundles of labour.

#### 4. *Conclusions*

In this paper, we have described moonlighting behaviour in Canada and the US in 1991, and the changes in this behaviour over the past 15 years. What are the major findings? First, education plays a major role in moonlighting, with higher educated workers more likely to moonlight. Second, marital status is also quite important, but the particular status with the highest moonlighting rate differs by gender. Third, about two-thirds of moonlighters take a second job for financial reasons. Fourth, total hours worked per week are much higher for moonlighters than non-moonlighters, and hourly wages on the primary job are higher for moonlighters for all but



US females. Fifth, unmarried females and married males are most likely to moonlight. Finally, there is evidence that workers moonlight due to both primary job constraints and job heterogeneity.

Now, how does moonlighting behaviour differ between Canada and the US? First, overall moonlighting rates are higher in the US than in Canada, although females in both countries moonlight at approximately the same rate. Second, US moonlighters tend to be older on average than Canadian moonlighters, while Canadian moonlighters tend to be somewhat more educated. And third, total hours worked are considerably higher in the US than in Canada. So what are the reasons for the differences between Canada and the US? One factor contributing to the higher moonlighting rate in the US is higher US divorce rates. US males are more likely to be unmarried fathers (custodial or not), and these fathers moonlight at very high rates. Canadians might moonlight less overall in part due to the higher unemployment rates in Canada. With such an excess supply of labour, both primary and secondary jobs are hard to find.

What do we learn from the trend comparison? Both countries have experienced strong increases in moonlighting rates for women, never-married individuals, young persons, and service workers, while university educated persons have consistently maintained high rates. US moonlighters remain much more likely to be "job-packaging," while their Canadian counterparts, particularly female Canadians, are increasingly becoming multiple-job holders as opposed to the traditional notion of moonlighters. This is reflected by the fact that US moonlighters continue to work, on average, longer hours relative to Canadian moonlighters, while the incidence of moonlighting for workers with a part-time primary job has risen significantly for the latter group. Most importantly, evidence from both countries exists to support each of the four broad reasons for moonlighting: worker flexibility, economic insecurity and hardship, composition of the workforce, and demand-side factors.

Finally, what are the implications of all these numbers? Or, why do we care about moonlighting? To put it succinctly, moonlighting itself is not so much a problem as it is a symptom of a broader labour market problem. Two issues are of most importance here: time pressures faced by moonlighters and their families and the degree to which moonlighting reflects perceived financial hardship. First, because total hours worked for moonlighting are considerably

higher than for non-moonlighters, rising moonlighting rates imply increased time pressures faced by individuals and families. For children, this implies increases in non-parental child care. Second, moonlighters clearly face financial pressures. They do not tend to be lower income workers, so their financial concerns extend beyond the basics of minimal shelter and food to more middle class concerns such as saving for retirement and their children's college educations, and home ownership. While these pressures are not as desperate as those faced by low income workers, they probably reflect for many moonlighters the desire to achieve the standard of living they enjoyed during their upbringing. For divorced mothers, they reflect a desire to maintain the lifestyle experienced during the previous marriage. And, the plight of moonlighters reflects the growing frustrations of today's workers who feel they are working more for less.



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Table 1

## Incidence (%) of Moonlighting in Canada and the U.S. by Characteristics and Gender

	Canada			United States		
	Both Sexes	Males	Females	Both Sexes	Males	Females
Characteristics:						
All individuals	5.04	4.82	5.31	6.01	6.56	5.34
Age:						
17-24 years	5.42	4.34	6.58	5.43	6.06	4.74
25-44 years	5.15	5.07	5.24	6.57	7.10	5.91
45-64 years	4.61	4.56	4.67	5.14	5.67	4.48
Education:						
none or elementary	3.37	3.50	3.18	3.10	3.13	3.06
high school	4.29	4.02	4.56	5.03	5.41	4.60
some post sec./diploma	6.07	5.75	6.43	7.22	8.32	6.08
university degree	6.21	5.90	6.63	8.04	8.86	6.93
Marital Status:						
married	5.02	5.05	4.97	5.96	7.06	4.43
never married	5.11	4.34	6.09	5.83	5.75	5.94
other	5.06	4.31	5.59	6.58	5.38	7.44
Children aged 0-5	5.07	5.06	5.10	6.26	7.89	3.90
Self-empl PJ (uninc + inc)	6.60	5.99	8.03	4.89	5.17	4.17
Self-empl PJ (uninc)	7.32	6.84	8.22	3.71	4.01	3.04
Self-empl PJ (uninc, no help)	7.16	5.74	9.36	na	na	na
Temporary job PJ <sup>a</sup>	7.12	5.54	8.90	na	na	na
Union member PJ <sup>a</sup>	4.52	4.89	4.03	6.99	7.47	6.26
Occupation PJ:						
Managerial	5.39	5.62	5.16	6.54	7.56	5.36
Clerical	5.54	5.64	5.51	6.15	6.70	6.02
Sales	4.91	4.74	5.11	5.28	6.81	3.92
Service	5.33	5.32	5.33	7.35	9.84	5.45
Primary	8.69	7.86	12.32	6.30	5.97	8.45
Processing	4.03	4.18	3.39	4.98	5.10	4.65
Construction, Transportation, and Material handling	3.16	2.94	5.49	4.44	4.49	3.97



Table 1  
(Continued)

	Canada			United States		
	Both Sexes	Males	Females	Both Sexes	Males	Females
Industry PJ:						
Agriculture	8.96	9.13	8.53	7.40	7.34	7.66
Other Primary	4.33	4.42	3.77	3.58	4.40	0
Manufacturing, Non-dur.	3.98	3.82	4.26	4.94	4.78	5.20
Manufacturing, Dur.	2.33	2.16	3.01	5.32	5.90	3.63
Construction	3.64	2.95	9.59	3.74	3.70	4.30
Transportation	3.89	3.44	5.16	6.32	6.62	5.60
Wholesale trade	4.30	4.47	3.93	7.14	7.25	6.87
Retail trade	5.39	6.04	4.76	4.52	5.28	3.78
Finance	5.26	3.56	6.33	4.82	5.58	4.20
Community Services	6.97	8.64	6.20	7.59	9.91	6.55
Personal Services	4.50	2.64	5.45	5.00	4.72	5.12
Business Services	5.26	5.82	4.52	6.00	6.52	5.06
Public Administration	4.83	5.96	3.40	10.00	12.81	5.95
# Moonlighters	1,606	877	729	941	536	405
Full Sample	29,875	16,375	13,500	14,727	7,896	6,831

<sup>a</sup>available for Canada only for employees on PJ.

Table 2

## Characteristics of Moonlighters in Canada and the U.S. by Characteristics and Gender

	Canada			United States		
	Both Sexes	Males	Females	Both Sexes	Males	Females
Characteristics:						
Age:						
17-24 years	16.6%	13.2%	20.3%	13.1%	12.8%	13.7%
25-44 years	58.7	60.0	57.3	63.3	63.1	63.7
45-64 years	24.7	26.8	22.4	23.5	24.1	22.6
Education:						
none or elementary	15.4%	18.3%	12.1%	6.8%	7.2%	6.1%
high school	20.4	18.7	22.3	33.2	31.6	35.7
some post sec./diploma	44.5	42.5	46.8	26.3	25.8	27.2
university degree	19.7	20.6	18.7	33.7	35.4	31.0
Marital Status:						
married	65.9%	70.8%	60.7%	60.9%	69.0%	47.6%
never married	26.5	24.1	29.1	23.7	21.5	27.1
other	7.5	5.1	10.2	15.4	8.8	25.3
Children aged 0-5	17.9%	20.2%	15.3%	20.0%	24.8%	12.8%
Family Income	na	na	na	43,925 (27,551)	46,665 (27,456)	39,834 (27,183)
Self-empl PJ (uninc + inc)	18.4%	22.3%	14.1%	9.1%	11.5%	5.5%
Self-empl PJ (uninc)	13.2	15.3	10.9	5.2	6.5	3.3
Self-empl PJ (uninc, no help)	9.2	8.5	9.9	na	na	na
Temporary job PJ <sup>a</sup>	7.2%	6.1%	8.3%	na	na	na
Union member PJ <sup>a</sup>	33.3%	40.7%	26.0%	20.4%	21.6%	18.5%
Total weekly hours	43.3 (14.6)	48.2 (13.5)	37.9 (13.9)	51.9 (15.6)	56.6 (15.2)	44.8 (13.5)
Distribution of total hours:						
0-29	15.3%	9.3%	22.0%	7.6%	3.8%	13.3%
30-39	22.6	14.6	31.4	7.6	3.7	13.6
40-49	25.1	25.1	25.2	30.1	24.4	38.6
50+	36.9	51.1	21.5	54.7	68.1	34.5
Mean Hourly Wage PJ <sup>a</sup>	13.7 (7.4)	15.9 (7.9)	11.8 (6.2)	13.41 (8.33)	14.61 (8.47)	11.71 (7.82)
Hourly Wage SJ: <sup>b</sup>						
under \$5.00	3.1%	2.4%	3.6%	15.7%	14.8%	17.0%
\$5.00 - \$6.99	25.5	21.3	28.4	20.9	14.2	29.9
\$7.00 - \$9.99	21.4	27.0	17.6	17.9	20.4	14.5
\$10.00 - \$13.99	22.7	22.3	23.0	14.4	17.9	9.9
\$14.00 - \$19.99	10.5	12.0	9.5	13.8	12.5	15.6
\$20.00 plus	16.8	15.1	17.9	17.2	20.2	13.2
Mean Hourly Wage SJ <sup>b</sup>	12.1 (6.7)	12.1 (6.5)	12.1 (6.9)	14.66 (19.80)	16.97 (24.12)	11.58 (11.09)

Table 2  
(Continued)

	Canada			United States		
	Both Sexes	Males	Females	Both Sexes	Males	Females
PJ Occupation:						
Managerial	35.0%	35.7%	34.3%	42.1%	43.6%	39.9%
Clerical	18.3	7.1	30.5	14.9	5.2	25.5
Sales	9.3	9.1	9.6	7.4	7.5	7.2
Service	14.0	11.5	16.7	13.5	13.0	14.3
Primary	6.2	8.8	3.4	2.9	4.0	1.3
Processing	9.3	14.9	3.1	10.2	12.9	6.0
Construction, Transportation, and Material handling	7.9	12.8	2.5	9.1	13.8	1.9
PJ Industry:						
Agriculture	4.8%	6.7%	2.8%	3.1%	4.1%	1.5%
Other primary	1.7	2.9	0.4	0.4	0.7	0
Manufacturing, non-dur.	6.3	7.4	5.1	6.1	6.1	6.2
Manufacturing, dur.	3.4	4.8	1.8	9.2	12.6	4.0
Construction	4.1	5.7	2.4	3.9	6.0	0.9
Transportation	5.7	7.2	4.2	7.8	9.6	5.1
Wholesale trade	4.1	5.7	2.3	4.9	6.0	3.3
Retail trade	13.9	14.7	13.1	12.0	11.5	12.8
Finance	6.1	3.1	9.5	5.4	4.7	6.5
Community service	27.1	20.1	34.8	30.2	20.4	45.0
Personal service	7.6	2.9	12.8	3.1	1.4	5.6
Business service	8.5	10.2	6.6	5.9	7.0	4.4
Public Administration	6.7	8.8	4.3	7.9	10.0	4.8
SJ Occupation:*						
Professional/Skilled	32.1%	35.5%	29.7%	33.0%	34.1%	31.4%
Clerical	18.5	6.7	26.9	10.1	4.7	18.3
Sales and service	37.7	36.7	38.4	30.9	24.7	40.2
Semi-skilled/Unskilled	11.7	21.0	5.0	25.9	36.5	10.1
SJ Industry:*						
Primary, secondary	13.4%	19.0%	9.4%	30.2%	39.0%	17.1%
Retail trade	19.3	16.6	21.2	23.5	19.6	29.4
Service industries	67.3	64.4	69.4	46.3	41.5	53.5
Percentage of Moonlighters in SJ Occupations/Industries Who Worked in the same Occupation/Industry Category on Their PJ						
SJ Occupation:						
Professional/skilled	67.4%	74.2%	61.6%	69.9%	70.7%	68.6%
Clerical	44.7	24.2	48.3	42.3	27.8	47.8
Sales and service	36.6	35.9	37.1	32.0	37.3	27.1
Semi-skilled/unskilled	39.1	45.1	21.0	43.5	46.9	25.3
SJ Industry: <sup>2</sup>	33.2%	40.4%	22.8%	53.9%	57.9%	40.3%
Primary, secondary	20.7	22.7	19.5	16.0	20.7	11.3
Retail trade	61.4	57.8	63.8	58.9	49.8	69.5
Service industries						
Number of observations	1,606	877	729	941	536	405

<sup>a</sup>available information only for paid employees on PJ.

<sup>b</sup>available information only for paid employees on SJ.

\* Canadian information available only for moonlighters who are employees in SJ.

Table 3  
Summary Statistics for Non-Moonlighting Workers in Canada and the U.S.  
by Characteristics and Gender

	Canada			United States		
	Both Sexes	Males	Females	Both Sexes	Males	Females
Characteristics:						
Age:						
17-24 years	15.4%	14.7%	16.2%	14.6%	13.9%	15.5%
25-44 years	57.5	56.9	58.2	57.6	57.9	57.2
45-64 years	27.2	28.4	25.7	27.7	28.2	27.2
Education:						
none or elementary	23.4%	25.6%	20.7%	13.6%	15.7%	11.0%
high school	24.2	22.6	26.2	40.1	38.7	41.8
some post sec./diploma	36.6	35.2	38.3	21.6	20.0	23.7
university degree	15.8	16.6	14.8	24.6	25.6	23.5
Marital Status:						
married	66.4%	67.4%	65.1%	61.5%	64.5%	58.0%
never married	26.1	26.9	25.2	24.5	24.7	24.2
other	7.5	5.8	9.7	14.0	10.8	17.8
Children aged 0-5	17.8%	19.25%	16.0%	19.2%	20.4%	17.8%
Family Income	na	na	na	\$44,248 (27,659)	\$44,941 (27,860)	\$43,405 (27,389)
Self-empl PJ (uninc + inc)	13.8%	17.7%	9.1%	11.3%	14.8%	7.1%
Self-empl PJ (uninc)	8.8	10.5	6.8	8.6	10.8	5.9
Self-empl PJ (uninc, no help)	6.3	7.1	5.4	na	na	na
Temporary job PJ	4.7%	5.0%	4.5%	na	na	na
Union member PJ	35.4%	37.8%	32.8%	16.7%	18.3%	14.7%
Mean Total weekly hours	35.45 (12.6)	38.65 (12.1)	31.6 (12.0)	39.3 (11.2)	42.2 (10.7)	35.9 (10.8)
Distribution of hours:						
0-29	22.3%	13.4%	32.9%	12.8%	7.0%	19.8%
30-39	32.7	28.7	37.5	10.8	6.2	16.4
40-49	32.7	40.3	23.6	61.5	65.3	57.0
50+	12.4	17.6	6.0	14.9	21.5	6.8
Mean Hourly Wage PJ	14.53 (7.6)	15.92 (7.6)	13.13 (7.6)	12.89 (7.8)	14.53 (8.6)	11.07 (6.3)
Occupation:						
Managerial	32.6%	30.4%	35.4%	38.5%	37.4%	39.8%
Clerical	16.6	6.0	29.6	14.5	5.0	26.0
Sales	9.6	9.3	10.0	8.5	7.2	10.0
Service	13.2	10.4	16.7	10.9	8.4	14.0
Primary	3.5	5.2	1.4	2.8	4.4	0.8
Processing	11.7	17.4	4.9	12.4	16.9	6.9
Construction, Transportation, and Material handling	12.8	21.4	2.4	12.5	20.7	2.6

Table 3  
(Continued)

	Canada			United States		
	Both Sexes	Males	Females	Both Sexes	Males	Females
Industry:						
Agriculture	2.6%	3.4%	1.7%	2.5%	3.6%	1.0%
Other primary	2.0	3.2	0.6	0.7	1.1	0.3
Manufacturing, non-dur.	8.1	9.1	6.5	7.5	8.5	6.3
Manufacturing, dur.	7.5	10.9	3.3	10.4	14.1	6.0
Construction	5.7	9.4	1.3	6.5	10.9	1.1
Transportation	7.5	10.2	4.3	7.4	9.5	4.8
Wholesale trade	4.8	6.2	3.2	4.1	5.4	2.5
Retail trade	13.0	11.6	14.7	16.2	14.5	18.3
Finance	5.9	4.2	7.87	6.8	5.6	8.4
Community service	19.2	10.8	29.5	23.5	13.0	36.3
Personal service	8.6	5.4	12.5	3.8	2.0	5.9
Business service	8.2	8.4	7.9	5.9	7.0	4.7
Public administration	7.0	7.0	6.9	4.6	4.8	4.3
Number of observations	28,269	15,498	12,771	13,786	7,360	6,426



Table 4  
Characteristics of Moonlighters by Marital Status and Gender

	Canada			United States			
Characteristic	Married	Never Married	Other	Married	Never Married	Divorced (contained in Other)	Other
Females							
Age:							
17-24 years	9.9%	48.7%	0.9%	4.0%	42.9%	1.0%	0.7%
25-44 years	64.9	39.2	63.9	75.9	51.8	54.4	53.4
45-64 years	25.2	12.1	35.3	20.1	5.3	44.6	45.9
Education:							
none or elementary	12.2%	12.8%	9.8%	7.8%	3.7%	4.1%	5.6%
high school	25.1	15.3	25.8	33.0	27.0	51.2	50.0
some post sec./diploma	46.0	45.6	55.6	28.3	33.1	14.4	18.7
university degree	16.7	26.3	8.8	30.9	36.2	30.4	25.7
Children aged 0-5	23.6%	0.8%	7.6%	20.3%	4.9%	7.2%	7.0%
Family income	na	na	na	\$45,973 (28,554)	\$37,253 (26,264)	\$31,932 (24,140)	\$30,427 (21,671)
Self-empl PJ (uninc + inc)	18.7%	9.9%	8.7%	9.0%	1.7%	1.7%	2.9%
Self-empl PJ (uninc)	13.5	6.4	7.9	5.5	0.6	0.3	2.0
Self-empl PJ (uninc, no help)	12.0	6.4	7.6	na	na	na	na
Temporary job PJ	5.0%	14.4%	8.2%	na	na	na	na
Union member PJ	30.4%	16.4%	30.6%	19.1%	10.0%	27.7%	26.4%
Mean Total weekly hours	37.24 (14.0)	38.62 (14.1)	39.45 (12.7)	41.6 (13.6)	46.4 (14.3)	50.3 (11.4)	49.4 (10.7)
Distribution of total hours:							
0-29	25.0%	18.0%	14.9%	19.4%	11.7%	5.0%	3.6%
30-39	29.4	38.8	22.7	16.3	12.6	5.6	9.3
40-49	26.2	19.7	34.7	38.2	34.4	44.0	43.9
50+	19.4	23.6	27.7	26.1	41.2	45.5	43.2
Mean Hourly wage, PJ	12.88 (6.9)	9.84 (4.8)	11.61 (4.4)	11.17 (8.0)	11.84 (9.1)	13.04 (5.7)	12.52 (5.6)
Hourly wage, SJ:							
under \$5.00	2.8%	4.2%	5.8%	13.7%	25.6%	12.3%	12.8%
\$5.00 - \$6.99	19.2	40.3	34.4	31.7	31.2	27.3	25.5
\$7.00 - \$9.99	16.1	16.5	27.6	16.8	16.2	6.2	8.6
\$10.00 - \$13.99	25.8	21.6	14.8	6.4	9.0	14.0	16.8
\$14.00 - \$19.99	15.6	1.4	5.9	17.5	7.0	24.6	21.9
\$20.00 plus	20.5	16.1	11.4	14.0	10.9	15.7	14.5
Mean Hourly wage, SJ	13.51 (6.9)	10.77 (6.8)	10.12 (6.3)	11.79 (10.6)	10.14 (11.0)	13.42 (13.2)	12.83 (11.8)
Number of observations	499	159	71	196	113	62	96

Table 5

## Main Reasons for Undertaking Moonlighting in Canada and the United States

	Canada			United States		
	Both Sexes	Males	Females	Both Sexes	Males	Females
Meet Regular Household Expenses	33.7%	33.4%	33.9%	31.2%	28.0%	36.0%
Pay Off Debts	11.3	12.2	10.5	11.0	11.2	10.7
Buy Something Special	4.6	4.5	4.7	7.2	6.7	7.9
Save for the Future	12.4	12.8	12.1	10.7	11.1	10.1
Gain Experience/Build Business	10.8	9.7	11.5	7.8	7.1	8.7
Enjoys the Work of SJ	15.0	14.6	15.3	13.9	15.2	11.9
Other	12.3	12.7	12.0	18.4	20.8	14.7

*Note:* Canadian information in this table pertains only to moonlighters who were "employees" in their second job.

Table 4  
(Continued)

	Canada			United States			
Characteristic	Married	Never Married	Other	Married	Never Married	Divorced (contained in Other)	Other
Males							
Age:							
17-24 years	4.2%	42.3%	0.0%	5.9%	40.5%	0	0
25-44 years	62.9	51.2	61.4	64.9	55.9	63.3	66.8
45-64 years	32.9	6.5	38.6	29.3	3.6	36.7	33.2
Education:							
none or elementary	20.4%	13.1%	14.8%	6.4%	9.7%	7.6%	8.1%
high school	18.7	19.9	13.8	32.1	31.6	28.1	27.6
some post sec./diploma	40.5	46.8	48.4	26.1	21.5	36.8	33.4
university degree	20.5	20.2	23.0	35.5	37.2	27.5	30.9
Children aged 0-5	28.1%	1.2%	1.3%	34.6%	0.3%	8.1%	6.8%
Family income	na	na	na	\$51,196 (26,581)	\$35,444 (26,006)	\$37,979 (28,159)	\$36,813 (27,486)
Self-empl PJ (uninc + inc)	26.5%	9.9%	21.7%	11.5%	12.5%	1.4%	9.0%
Self-empl PJ (uninc)	17.3%	9.6%	13.1%	5.5%	9.8%	0	5.5%
Self-empl PJ (uninc, no help)	8.9	7.8	7.0	na	na	na	na
Temporary job PJ	3.4%	10.8%	16.2%	na	na	na	na
Union member PJ	42.8%	33.1%	54.6%	25.1%	14.7%	12.7%	10.4%
Total weekly hours	50.27 (12.4)	42.19 (15.3)	47.09 (12.33)	58.4 (14.2)	51.4 (16.9)	54.4 (10.0)	54.4 (14.7)
Distribution of total hours:							
0-29	5.4%	21.3%	7.4%	1.8%	9.4%	1.3%	6.1%
30-39	13.7	15.2	24.1	2.1	9.5	3.6	2.8
40-49	23.4	29.4	28.8	23.1	29.0	21.2	23.8
50+	57.6	34.2	39.8	73.1	52.1	74.0	67.3
Hourly wage, PJ	17.59 (7.7)	10.74 (4.6)	23.22 (9.6)	15.72 (8.6)	11.22 (6.3)	14.92 (9.9)	14.13 (9.5)
Hourly wage, SJ:							
under \$5.00	4.1%	0%	0%	15.0%	17.3%	4.9%	7.8%
\$5.00 - \$6.99	10.1	41.8	8.3	10.9	18.4	16.8	25.3
\$7.00 - \$9.99	26.1	29.8	19.1	20.7	24.3	12.3	9.1
\$10.00 - \$13.99	26.6	15.9	18.4	18.3	16.7	14.8	17.7
\$14.00 - \$19.99	14.4	9.3	3.5	14.2	9.1	14.0	10.3
\$20.00 plus	18.7	3.1	50.8	21.0	14.2	37.2	29.9
Hourly wage SJ	13.3 (6.6)	9.04 (4.4)	17.54 (8.1)	17.95 (26.6)	13.32 (16.3)	19.58 (22.3)	22.67 (24.3)
Number of observations	691	153	33	365	121	38	50

Table 7  
OLS Log PJ Wage Equations in Canada and the United States

Variables	Males		Females	
	Canada	United States	Canada	United States
Intercept	2.1808*** (113.256)	1.7012*** (68.907)	2.2388*** (128.569)	1.7278*** (75.602)
Age 25-34	0.2967*** (22.986)	0.2732*** (15.603)	0.1929*** (15.935)	0.2450*** (14.068)
Age 35-44	0.4496*** (33.302)	0.4521*** (25.015)	0.2795*** (22.264)	0.3172*** (17.737)
Age 45 +	0.4585*** (32.585)	0.5103*** (28.325)	0.2611*** (19.528)	0.2980*** (17.625)
High School	0.1172*** (9.867)	0.2138*** (13.047)	0.1394*** (11.453)	0.2040*** (11.201)
Some post-secondary	0.2063*** (19.345)	0.3520*** (19.023)	0.2177*** (19.075)	0.3378*** (17.047)
University degree	0.4382*** (29.444)	0.6215*** (33.000)	0.4950*** (32.077)	0.5772*** (28.110)
No. of children	---	---	-0.0162*** (-4.389)	-0.0287*** (-4.986)
Region 1 <sup>†</sup>	-0.2427*** (-19.632)	0.1248*** (8.363)	-0.2136*** (-18.076)	0.1179*** (8.274)
Region 2	-0.0557*** (-4.692)	0.0261* (1.755)	-0.0333*** (-2.799)	0.0051 (0.353)
Region 3	-0.1417*** (-10.200)	0.0982*** (6.485)	-0.1179*** (-9.094)	0.1148*** (7.749)
Region 4	-0.3537*** (-2.271)	---	-0.0489*** (-3.306)	---
Region 5	0.2196 (1.391)	---	-0.0353** (-2.246)	---
Agriculture	-0.2943*** (-8.736)	-0.3375*** (-7.951)	-0.3699*** (-9.460)	-0.1641*** (-2.404)
Other Primary	0.2576*** (11.816)	0.2738*** (5.547)	0.0142 (0.298)	0.1043 (1.235)
Manufacturing, non-durable	0.0711*** (4.018)	0.1724*** (7.348)	-0.1733*** (-9.621)	-0.0203 (-0.911)
Manufacturing, durable	0.0888*** (5.091)	0.2351*** (11.449)	-0.0988*** (-3.801)	0.0927*** (4.027)
Construction	0.1072*** (5.664)	0.2234*** (9.769)	-0.1696*** (-4.490)	0.0471 (0.902)
Transportation	0.0928*** (5.206)	0.2501*** (11.047)	0.0607*** (2.927)	0.1840*** (7.226)

Table 6  
Main Reason for Undertaking Moonlighting in Canada and the United States  
by Marital Status and Gender

	Canada			United States			
	Married	Never Married	Other	Married	Never Married	Divorced (contained in Other)	Other
Females							
Meet reg. household exp.	34.3%	21.1%	62.3%	25.7%	30.7%	59.4%	60.9%
Pay off debts	5.1	18.6	13.3	7.5	17.3	11.4	9.7
Buy something special	3.5	4.7	8.2	9.8	6.8	1.5	5.5
Save for the future	11.2	18.0	0.8	6.9	15.6	14.1	10.3
Gain Exp./Build bus.	12.1	14.1	9.5	12.8	6.1	3.9	3.9
Enjoys work of SJ	22.6	12.9	4.7	16.6	10.5	3.0	4.6
Other	11.2	10.5	1.4	20.7	13.0	6.7	5.1
Number of observations	499	159	71	196	113	62	96
Males							
Meet reg. household exp.	39.5%	21.1%	35.2%	27.1%	23.1%	47.1%	47.9%
Pay off debts	9.7	18.6	5.2	9.5	14.3	17.4	16.7
Buy something special	4.8	4.7	0	4.7	12.9	6.3	6.7
Save for the future	11.2	18.0	2.6	11.8	12.4	3.6	2.8
Gain exp./Build bus.	8.3	14.1	0	7.9	3.1	9.2	10.7
Enjoys work of SJ	13.3	12.9	37.8	17.4	11.5	6.7	5.8
Other	13.2	10.5	19.1	21.6	22.6	9.7	9.5
Number of observations	691	153	33	365	121	38	50

*Note:* Canadian information in this table pertains only to moonlighters who were "employees" in their second job.



Table 8  
OLS Log SJ Wage Equations in Canada and the United States

Variables	Males		Females	
	Canada	United States	Canada	United States
Intercept	1.9828*** (4.939)	2.2316*** (2.906)	1.4408*** (5.998)	2.0342*** (3.467)
Age 25-34	0.1619* (1.694)	0.1481 (1.128)	0.2741*** (3.733)	0.2042* (1.886)
Age 35-44	0.4153*** (3.740)	0.3407** (2.241)	0.3090*** (4.061)	0.2379** (2.071)
Age 45+	0.2518* (1.853)	0.5074*** (3.308)	0.1924** (2.131)	0.1721 (1.333)
High School	0.1535 (1.419)	0.0836 (0.467)	0.1410 (1.587)	0.0556 (0.310)
Some post-secondary	0.2696*** (2.668)	0.2134 (1.029)	0.3553*** (4.302)	0.2017 (1.039)
University degree	0.4828*** (3.880)	0.3305 (1.536)	0.5535*** (5.350)	0.4641*** (2.399)
No. of children	---	---	0.0139 (0.679)	0.0450 (1.157)
Region 1 <sup>†</sup>	-0.1889 (-1.620)	-0.333 (-0.245)	-0.2143*** (-2.374)	-0.1140 (-1.087)
Region 2	-0.0107 (-0.094)	-0.0593 (-0.481)	-0.0952 (-0.811)	-0.1505 (-1.344)
Region 3	-0.2241* (-1.905)	0.1868 (1.532)	-0.0792 (-1.095)	0.0731 (0.665)
Region 4	-0.0239 (-0.186)	---	-0.2470*** (-2.837)	---
Region 5	-0.1507 (-1.120)	---	-0.0625 (-0.636)	---
Lambda	-0.0209 (-0.131)	-0.1708 (-0.532)	1.2921* (1.839)	-0.1120 (-0.486)
R <sup>2</sup>	0.2807	0.1420	0.2503	0.1720
Number of observations	161	223	280	248

<sup>†</sup> In Canada, the regions are: 1: Atlantic; 2: Quebec; 3: Manitoba and Saskatchewan; 4: Alberta; 5: British Columbia. In the U.S., the regions are: 1: Northeast; 2: Midwest; 3: West.

\*, \*\*, \*\*\* represent significance at the 10, 5 and 1 percent levels, respectively.

Table 7  
(Continued)

Variables	Males		Females	
	Canada	United States	Canada	United States
Wholesale trade	-0.0539*** (-2.533)	0.1052*** (3.740)	-0.2530*** (-9.314)	0.0022 (0.063)
Retail trade	-0.1888*** (-10.481)	-0.0988*** (-4.651)	-0.3979*** (-30.579)	-0.2327*** (-14.796)
Finance	0.0848*** (3.074)	0.2162*** (7.681)	-0.0771*** (-4.540)	0.0705*** (3.498)
Personal services	-0.3748*** (-15.913)	-0.1158*** (-2.721)	-0.5313*** (-36.377)	-0.3456*** (-13.048)
Business services	-0.0566*** (-2.622)	0.0526** (1.983)	-0.1695*** (-9.163)	-0.0191 (-0.696)
Public administration	0.1581*** (8.673)	0.1856*** (7.164)	0.0637*** (3.999)	0.1675*** (6.604)
R <sup>2</sup>	0.4026	0.3961	0.4375	0.3425
Number of observations	8,643	6,477	8,846	6,210

<sup>†</sup> In Canada, the regions are: 1: Atlantic; 2: Quebec; 3: Manitoba and Saskatchewan; 4: Alberta; 5: British Columbia. In the U.S., the regions are: 1: Northeast; 2: Midwest; 3: West.

\*, \*\*, \*\*\* represent significance at the 10, 5, and 1 percent levels, respectively.

Table 10  
Incidence (%) of Moonlighting Over Time in Canada and the United States,  
by Characteristics

	Canada				United States			
	1981	1985	1991	1995	1981	1985	1991	1994 <sup>1</sup>
<b>All Workers</b>								
<b>Characteristics:</b>								
All workers	3.38	3.99	5.04	5.47	4.62	5.18	6.01	5.9
Male	3.61	4.13	4.82	4.98	4.98	5.72	6.56	5.9
Female	3.02	3.79	5.31	6.07	4.17	4.49	5.34	5.9
<b>Age:</b>								
17-24 years	3.04	3.77	5.42	7.30	4.00	5.17	5.43	6.27
25-44 years	3.72	4.14	5.15	5.58	5.30	5.65	6.57	6.16
45-64 years	2.99	3.82	4.61	4.41	3.86	4.26	5.14	5.58
<b>Education:</b>								
0-8 years	2.68	2.96	2.61	3.06	4.95	2.31	3.31	na
secondary school	2.95	3.30	4.04	4.25	3.53	4.38	4.65	na
some post sec./diploma	3.77	4.60	6.07	6.11	5.47	6.11	7.22	na
university degree	5.22	5.89	6.21	6.94	6.98	6.88	8.04	na
<b>Marital Status:</b>								
married	3.38	4.12	5.02	5.20	4.57	5.11	5.96	5.6
never married	3.26	3.80	5.11	6.31	4.36	5.34	5.83	6.4
other	3.79	3.49	5.06	5.06	5.27	5.23	6.58	6.2
Children aged 0-5	3.48	4.45	5.07	5.52	na	na	6.26	na
PJ is part time	na	6.83	na	10.69	5.56	6.91	7.37	na
PJ is full time	na	3.46	na	4.34	4.48	4.91	5.81	na
Self-empl PJ (uninc + inc) <sup>1</sup>			6.60		na	3.66	4.89	na
Self-empl PJ (uninc)	5.84	6.82	7.32	7.41	na	na	3.71	na
Self-empl PJ (uninc, no help)	6.38	7.49	7.16	7.80	na	na	na	na
<b>Occupation:</b>								
managerial	4.27	4.95	5.39	6.16	6.53	5.81	6.54	
clerical	2.77	3.33	5.54	5.18	3.24	4.64	6.15	
sales	2.77	4.08	4.91	5.79	4.02	5.32	5.28	
service	3.76	4.19	5.33	6.22	6.39	6.30	7.35	na
primary	5.76	5.82	8.69	8.55	4.96	5.52	6.30	
processing	2.37	2.69	4.03	3.32	3.11	4.09	4.98	
construction, transportation, material handling	3.03	3.15	3.16	4.13	3.37	4.03	4.44	
<b>Industry:</b>								
agriculture	7.09	7.22	8.96	9.88	6.98	5.15	7.40	
other primary	2.80	2.59	4.33	3.57	3.52	3.95	3.58	
manufacturing, non-durable	1.97	2.75	3.98	3.21	2.80	4.08	4.94	
manufacturing, durable	1.93	2.45	2.33	2.60	3.46	4.26	5.32	
construction	2.58	3.65	3.64	4.18	3.82	4.42	3.74	
transportation	4.00	3.98	3.89	4.96	4.48	4.45	6.32	na
wholesale trade	3.30	3.85	4.30	5.16	3.00	5.36	7.14	
retail trade	2.67	3.65	5.59	5.35	4.42	4.54	4.52	
finance	2.98	3.09	5.26	3.96	4.66	4.83	4.82	
community services	4.92	5.71	6.97	7.94	6.42	6.95	7.59	
personal services	3.01	3.80	4.50	6.18	5.04	4.21	5.00	
business services	3.82	4.74	5.26	5.86	4.12	4.53	6.00	
public administration	4.02	3.69	4.83	5.12	6.01	7.85	10.00	

Table 9  
Moonlighting Probit Regressions\*  
(Includes a coefficient, t-statistics and derivatives in parentheses;  
for the two wages, elasticities are given in brackets)

Regressors	Canada		United States	
	Males	Females	Males	Females
Intercept	-0.3144 (-0.464) -0.0129	-2.9380*** (-6.575) -0.1952	-0.6243 (-0.777) -0.0447	-1.2681* (-1.671) -0.0994
PJ Wage [elasticity]	-0.3692* (-1.809) -0.0151 [-0.8110]	0.1296 (0.927) 0.0086 [0.2749]	-0.5683*** (-2.846) -0.0407 [-1.1810]	0.1102 (0.518) 0.0086 [0.2163]
SJ Wage [elasticity]	-0.4555 (-1.213) -0.0186 [-1.0005]	0.6028* (1.887) 0.0400 [1.2606]	-0.0998 (-0.304) -0.0071 [-0.2075]	-0.5245 (-1.530) -0.0411 [-1.0291]
Age 25-34	-0.1188 (-0.928) -0.0049	-0.3646*** (-3.117) -0.0242	0.0423 (-0.342) -0.0030	0.0194 (0.144) 0.0015
Age 35-44	0.0032 (0.017) 0.0001	-0.4661*** (-3.559) -0.0310	-0.0387 (-0.209) -0.0028	-0.0283 (-0.180) -0.0022
Age $\geq 45$	-0.2114 (-1.203) -0.0086	-0.4991*** (-4.078) -0.0332	0.0221 (0.096) 0.0016	-0.2805* (-1.867) -0.0220
Education = 12	0.3178*** (2.904) (0.0130)	0.0227 (0.237) 0.0015	0.3704*** (3.094) 0.0265	0.2858** (2.092) 0.0224
Education 13-15	0.3801*** (2.910) 0.0156	-0.0830 (-0.624) -0.0055	0.6518*** (4.335) 0.0466	0.4909*** (2.957) 0.0385
Education $\geq 16$	0.6915*** (3.406) 0.0283	-0.2493 (-1.235) -0.0166	0.8501*** (4.309) 0.0608	0.6142*** (2.537) 0.0481
Preschool Children	-0.0041 (-0.041) -0.0002	-0.0354 (-0.422) -0.0023	0.0038 (0.039) 0.0003	-0.2679*** (-2.652) -0.0210
# Children	-0.0159 (-0.504) -0.0006	-0.0034 (-0.129) -0.0003	0.0258 (0.698) 0.0018	0.1013*** (2.457) 0.0079
Single	-0.0045 (-0.046) -0.0002	0.1420* (1.946) 0.0094	-0.0679 (-0.693) -0.0049	0.2272*** (2.527) 0.0178
Not married-Other	0.1154 (0.746) 0.0047	0.3203*** (3.759) 0.0213	-0.0063 (-0.055) -0.0004	0.3723*** (4.773) 0.0292
Log-likelihood	-776.271	-1208.044	-949.876	-1008.746

\*These regressions exclude those self-employed on their PJ or SJ. Uses log wages from logwage equations.

Table 10  
(Continued)

	Canada				United States			
	1981	1985	1991	1995	1981	1985	1991	1994 <sup>1</sup>
<b>Females</b>								
Characteristics:								
Female	3.02	3.79	5.31	6.07	4.17	4.49	5.34	5.9
Age:								
17-24 years	3.11	3.83	6.58	8.63	4.12	5.08	4.74	7.0
25-44 years	3.23	4.08	5.24	6.07	4.60	4.85	5.91	6.0
45-64 years	2.44	3.05	4.67	4.72	3.44	3.31	4.48	5.4
Education:								
0-8 years	2.32	1.78	3.18	2.76	4.99	1.93	4.36	na
secondary school	2.52	3.22	4.56	4.40	3.20	3.63	4.28	na
some post sec./diploma	3.78	4.45	6.43	6.87	4.92	5.34	6.08	na
university degree	4.56	5.68	6.63	7.95	6.66	6.35	6.93	na
Marital Status:								
married	2.90	3.59	4.97	5.66	3.48	3.72	4.43	5.0
never married	3.11	4.09	6.09	7.49	5.03	5.70	5.94	7.2
other	3.58	4.25	5.59	5.46	5.05	5.26	7.44	6.7
Children aged 0-5	3.30	3.89	5.10	5.59	na	na	3.90	na
PJ is part time	na	5.96	na	10.78	5.02	6.79	7.76	na
PJ is full time	na	2.98	na	4.23	3.95	3.87	4.72	na
Self-empl PJ (uninc + inc)			8.03		na	4.5	4.17	na
Self-empl PJ (uninc)	5.85	7.56	8.22	8.96	na	na	3.04	na
Self-empl PJ (uninc, no help)	6.27	7.62	9.36	9.05	na	na	na	na
Occupation:								
managerial	3.73	4.53	5.16	6.92	5.95	5.20	5.36	
clerical	2.57	3.24	5.51	4.92	3.27	4.36	6.02	
sales	2.76	4.04	5.11	6.22	3.10	4.48	3.92	
service	3.65	3.61	5.33	6.25	5.26	4.84	5.45	na
primary	6.10	6.64	12.32	12.56	3.46	6.09	8.45	
processing	1.09	1.75	3.39	2.15	2.09	1.73	4.65	
construction, transportation, material handling	3.15	5.81	5.49	6.70	5.32	2.57	3.97	
Industry:								
agriculture	4.50	7.87	8.53	11.48	3.17	5.43	7.66	
other primary	4.42	1.00	3.77	4.81	1.12	3.44	0	
manufacturing, non-durable	1.61	2.18	4.26	3.13	2.19	2.55	5.20	
manufacturing, durable	0.90	2.29	3.01	1.75	2.51	2.37	3.63	
construction	5.06	6.08	9.59	7.40	2.36	5.85	4.30	
transportation	3.63	4.49	5.16	5.54	5.31	4.13	5.60	na
wholesale trade	2.81	4.73	3.93	4.62	1.99	4.97	6.87	
retail trade	2.44	3.34	4.76	5.90	4.07	4.51	3.78	
finance	2.53	2.53	6.33	3.10	4.21	4.31	4.20	
community services	3.73	4.57	6.20	7.76	5.33	5.72	6.55	
personal services	3.14	3.85	5.45	6.15	3.99	3.38	5.12	
business services	4.60	5.28	4.52	6.74	5.40	3.98	5.06	
public administration	2.66	2.41	3.40	5.62	3.22	4.08	5.95	

<sup>1</sup> In U.S., 1981 data exclude the self-employed.



Table 10  
(Continued)

	Canada				United States			
	1981	1985	1991	1995	1981	1985	1991	1994 <sup>1</sup>
<b>Males</b>								
Characteristics:								
Male	3.61	4.13	4.82	4.98	4.98	5.72	6.56	5.9
Age:								
17-24 years	2.97	3.71	4.34	6.04	3.90	5.25	6.06	5.6
25-44 years	4.04	4.19	5.07	5.17	5.85	6.26	7.10	6.3
45-64 years	3.29	4.28	4.56	4.18	4.20	4.95	5.67	5.7
Education:								
0-8 years	2.82	3.50	2.89	3.20	4.93	2.47	2.88	na
secondary school	3.27	3.37	3.91	4.12	3.83	5.02	4.96	na
some post sec./diploma	3.77	4.73	5.75	5.43	5.94	6.77	8.32	na
university degree	5.54	6.01	5.90	6.15	7.19	7.23	8.86	na
Marital Status:								
married	3.66	4.46	5.05	4.84	5.32	6.03	7.06	6.1
never married	3.38	3.58	4.34	5.45	3.82	5.07	5.75	5.7
other	4.11	2.30	4.31	4.48	5.65	5.18	5.38	5.5
Children aged 0-5	3.57	4.78	5.06	5.46	na	na	7.89	na
PJ is part time	na	9.24	na	10.47	7.00	7.81	6.44	na
PJ is full time	na	3.73	na	4.42	4.84	5.60	6.57	na
Self-empl PJ (uninc)	5.84	6.47	6.84	6.42	na	na	4.01	na
Self-empl PJ (uninc, no help)	6.44	7.41	5.74	6.83	na	na	na	na
Occupation:								
managerial	4.66	5.27	5.62	5.36	6.93	6.27	7.56	
clerical	3.48	3.65	5.64	6.17	3.14	5.93	6.70	
sales	2.77	4.11	4.74	5.42	4.75	6.26	6.81	
service	3.89	4.94	5.32	6.17	8.25	8.26	9.84	na
primary	5.72	5.70	7.86	7.62	5.19	5.44	5.97	
processing	2.68	2.92	4.18	3.58	3.51	4.95	5.10	
construction, transportation, material handling	3.02	2.93	2.94	3.87	3.59	4.18	4.49	
Industry:								
agriculture	7.64	7.05	9.13	9.16	8.05	5.09	7.34	
other primary	2.61	2.81	4.42	3.36	3.95	4.05	4.40	
manufacturing, non-durable	2.19	3.10	3.82	3.25	3.22	5.19	4.78	
manufacturing, durable	2.14	2.48	2.16	2.79	3.79	4.90	5.90	
construction	2.35	3.38	2.95	3.82	3.93	4.30	3.70	
transportation	4.11	3.82	3.44	4.75	4.14	4.57	6.62	na
wholesale trade	3.48	3.55	4.77	5.36	3.32	5.50	7.25	
retail trade	2.89	3.96	6.04	4.80	4.82	4.57	5.28	
finance	3.70	3.90	3.56	5.20	5.43	5.58	5.58	
community services	7.07	7.95	8.64	8.36	8.85	9.41	9.91	
personal services	2.74	3.70	2.64	6.23	8.50	6.33	4.72	
business services	3.25	4.32	5.82	5.16	3.40	4.86	6.52	
public administration	4.79	4.55	5.96	4.73	7.45	10.76	12.81	

Table 11  
(Continued)

	Canada				United States			
	1981	1985	1991	1995	1981	1985	1991	1994 <sup>1</sup>
<b>Males</b>								
Characteristics:								
Male								
Age:								
17-24 years	16.3	15.9	13.2	15.4	16.6	16.0	12.8	14.2
25-44 years	58.0	55.9	60.0	59.2	60.0	59.5	63.1	57.2
45-64 years	25.4	28.2	26.8	25.4	23.4	24.4	24.1	27.2
Education:								
0-8 years	12.8	10.2	4.5	3.4	8.7	2.9	2.2	
secondary school	45.0	39.2	32.5	29.8	40.6	43.9	36.6	na
some post sec./diploma	20.8	27.4	42.5	43.1	22.5	22.6	25.8	
university degree	21.4	23.2	20.6	23.8	28.2	30.6	35.4	
Marital Status:								
married	72.3	75.0	70.8	66.0	71.0	69.9	69.0	64.1
never married	22.8	22.3	24.1	28.8	18.9	21.4	21.5	25.5
other	4.9	2.7	5.1	5.2	10.2	8.7	8.8	10.4
Children aged 0-5	18.5	20.1	20.2	17.6	na	na	24.8	na
PJ is part time	na	16.1	na	19.6	9.1	9.3	7.0	13.5
Total hours	49.9 (12.9)	47.9 (13.8)	48.2 (13.5)	48.6 (14.1)	54.5 (16.6)	56.4 (16.0)	56.6 (15.2)	52.6
Distribution of hours:								
0-29	5.9	9.5	9.3	10.3	5.0	3.3	3.8	
30-39	13.0	13.1	14.6	9.7	2.1	4.3	3.7	na
40-49	24.8	27.2	25.1	26.3	29.8	24.5	24.4	
50+	56.4	50.3	51.1	53.8	63.1	67.9	68.1	
Self-empl PJ (uninc)	15.4	15.6	15.3	13.9	na	na	6.5	na
Self-empl PJ (uninc, no help)	11.1	11.3	8.5	10.3	na	na	na	na
Occupation:								
managerial	30.6	36.6	35.7	32.2	37.2	40.0	43.6	
clerical	6.5	5.6	7.1	6.8	4.6	4.8	5.2	
sales	8.2	9.2	9.1	10.5	5.6	7.7	7.5	na
service	10.2	11.7	11.5	13.3	15.7	12.2	13.0	
primary	10.9	9.0	8.8	8.0	2.5	4.8	4.0	
processing	15.3	13.5	14.9	13.2	17.2	15.8	12.9	
construction, transportation, material handling	18.0	14.5	12.8	16.1	17.2	14.7	13.8	
Industry:								
agriculture	9.2	7.2	6.7	5.9	3.8	3.8	4.1	
other primary	3.0	2.5	2.9	2.1	1.4	1.2	0.7	
manufacturing, non-durable	6.4	7.4	7.4	5.8	6.8	7.4	6.1	
manufacturing, durable	8.0	7.8	4.8	6.5	15.1	13.9	12.6	
construction	6.2	7.0	5.7	6.8	7.0	8.3	6.0	
transportation	12.7	9.8	7.2	10.1	7.7	7.5	9.6	
wholesale trade	5.6	5.3	5.7	6.6	3.7	5.0	6.0	na
retail trade	8.7	11.1	14.7	10.9	12.5	11.3	11.5	
finance	3.7	3.7	3.1	4.7	4.6	4.6	4.7	
community services	18.9	19.1	20.1	18.1	21.8	20.8	20.4	
personal services	2.9	4.2	2.9	7.3	2.2	2.0	1.4	
business services	5.3	6.9	10.2	9.8	2.8	5.1	7.0	
public administration	9.6	8.0	8.8	5.6	10.5	9.1	10.0	

Table 11  
 Characteristics of Moonlighters Over Time in Canada and the United States,  
 by Characteristics

	Canada				United States			
	1981	1985	1991	1995	1981	1985	1991	1994 <sup>1</sup>
<b>All Workers</b>								
Characteristics:								
Male	59.7	59.9	51.1	50.2	59.5	62.0	60.0	54.0
Female	40.3	40.1	48.9	49.8	40.5	38.0	40.0	46.0
Age:								
17-24 years	20.4	18.8	16.6	18.2	19.4	18.5	13.1	16.3
25-44 years	56.7	57.1	58.7	58.4	57.6	59.0	63.3	55.9
45-64 years	22.9	25.1	24.7	23.5	23.0	22.5	23.5	26.6
Education:								
0-8 years	10.9	3.6	3.3	2.4	7.7	2.4	2.2	
secondary school	45.3	42.9	32.4	27.6	42.7	43.9	37.8	
some post sec./diploma	24.4	30.1	44.5	45.8	22.9	23.7	26.3	na
university degree	19.4	21.7	19.7	24.2	26.8	30.0	33.7	
Marital Status:								
married	68.1	68.9	65.9	63.9	61.0	61.2	60.9	56.4
never married	24.6	24.9	26.5	29.0	23.3	24.8	23.7	27.6
other	7.4	6.3	7.5	7.1	15.7	14.0	15.4	16.0
Children aged 0-5	18.5	17.8	17.9	15.2	na	na	20.0	na
PJ is part time	na	26.8	na	34.7	15.6	18.0	16.0	22.6
Total hours	45.2 (15.2)	43.8 (15.3)	43.3 (14.6)	43.9 (15.2)	51.2 (17.4)	52.4 (17.1)	51.9 (15.6)	48.2
Distribution of hours:								
0-29	15.3	16.9	15.3	17.9	8.8	8.0	7.6	25.0*
30-39	15.6	16.9	22.6	15.3	5.0	7.7	7.6	na
40-49	25.7	27.0	25.1	26.3	32.1	27.4	30.1	24.9
50+	43.4	39.2	36.9	40.6	54.0	56.9	54.7	50.2
Self-empl (uninc + inc)			18.4		na	5.9	9.1	na
Self-empl PJ (uninc)	13.9	14.4	13.2	13.2	na	na	5.2	na
Self-empl PJ (uninc, no help)	10.6	10.8	9.2	10.4	na	na	na	na
Occupation:								
managerial	31.2	36.6	35.0	38.1	35.3	40.5	42.1	
clerical	14.9	14.4	18.3	13.7	14.5	13.2	14.9	
sales	8.7	9.7	9.3	10.7	5.1	8.6	7.4	
service	13.8	13.6	14.0	15.1	19.2	13.5	13.5	na
primary	7.9	6.3	6.2	5.5	1.7	3.5	2.9	
processing	10.8	9.3	9.3	7.5	12.7	11.1	10.2	
construction, transportation, material handling	12.6	10.1	7.9	9.5	11.6	9.7	9.1	
Industry:								
agriculture	6.6	5.5	4.8	4.6	2.5	2.9	3.1	
other primary	2.3	1.6	1.7	1.3	0.9	0.8	0.4	
manufacturing, non-durable	5.9	6.4	6.3	4.5	6.0	6.2	6.1	
manufacturing, durable	5.6	5.6	3.4	3.7	11.1	10.1	9.2	
construction	4.8	5.1	4.1	4.2	4.3	5.7	3.9	
transportation	10.2	8.1	5.7	7.2	7.0	6.2	7.8	
wholesale trade	4.6	4.6	4.1	4.4	2.6	4.2	4.9	na
retail trade	10.2	12.1	13.9	12.4	14.7	14.3	12.0	
finance	5.0	4.3	6.1	4.3	6.3	6.0	5.4	
community services	23.6	24.5	27.1	28.1	30.2	28.6	30.2	
personal services	6.2	7.7	7.6	9.9	3.4	3.0	3.1	
business services	7.0	8.1	8.5	10.1	3.2	4.7	5.9	
public administration	8.1	6.5	6.7	5.4	7.7	7.3	7.9	

Figure 1

# Aggregate Moonlighting Rates Over Time in Canada and the United States

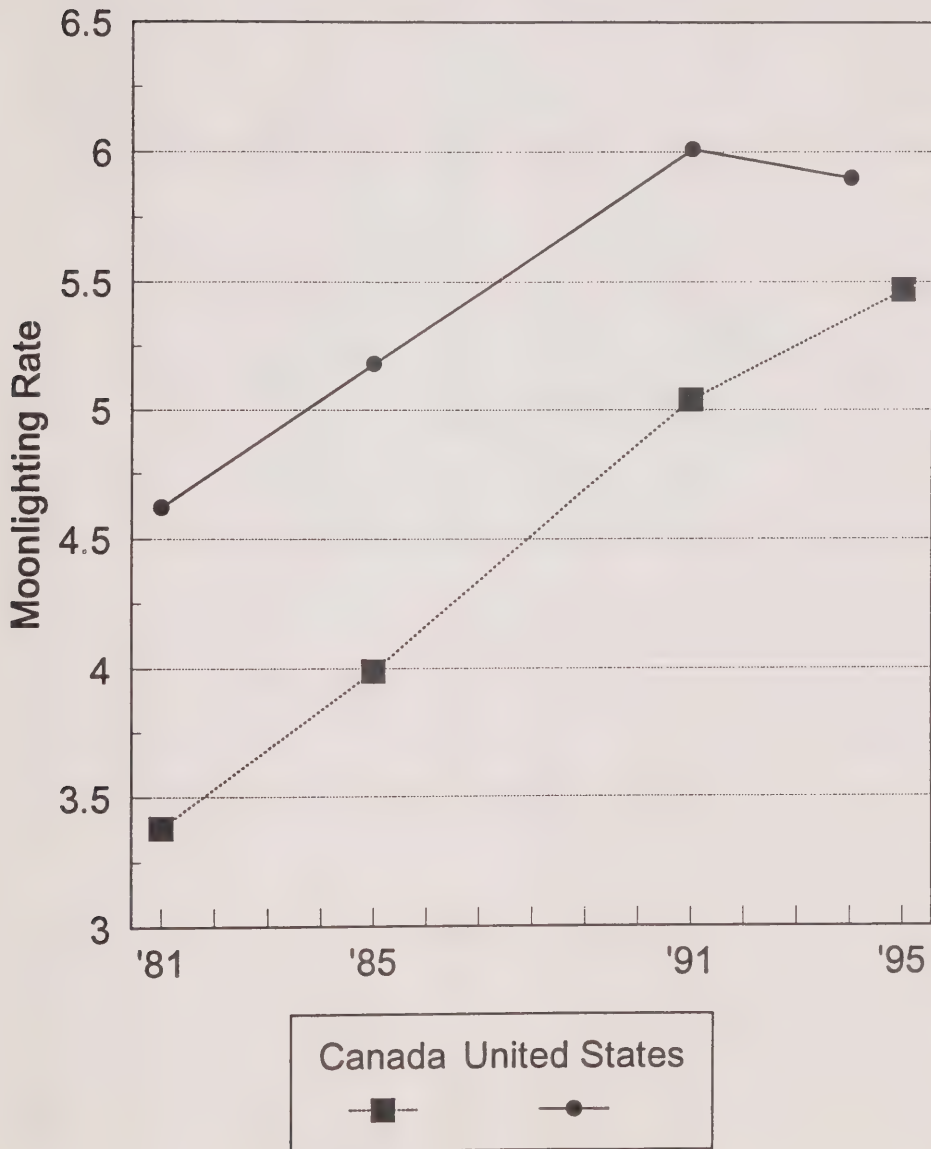


Table 11  
(Continued)

	Canada				United States			
	1981	1985	1991	1995	1981	1985	1991	1994 <sup>1</sup>
<b>Females</b>								
Characteristics:								
Female								
Age:								
17-24 years	27.6	23.2	20.3	21.0	23.6	22.5	13.7	18.9
25-44 years	54.4	58.9	57.3	57.5	54.1	58.2	63.7	54.3
45-64 years	18.1	17.9	22.4	21.5	22.4	19.3	22.6	25.9
Education:								
0-8 years	7.6	3.6	2.0	1.5	6.1	1.6	2.1	
secondary school	53.7	57.7	32.4	25.5	45.7	43.8	39.8	na
some post sec./diploma	20.9	19.3	46.8	48.5	23.4	25.5	27.2	
university degree	15.9	19.5	18.7	24.5	24.8	29.0	31.0	
Marital Status:								
married	60.6	59.7	60.7	61.7	46.4	46.9	47.6	47.4
never married	27.7	28.7	29.1	29.2	29.8	30.3	27.1	30.1
other	11.8	11.6	10.2	9.1	23.8	22.8	25.3	22.5
Children aged 0-5	15.7	14.3	15.3	12.8	na	na	12.8	na
PJ is part time	na	42.7	na	50.0	25.2	32.3	29.6	33.3
Total hours	36.9 (15.4)	37.6 (15.3)	37.9 (13.9)	39.2 (14.8)	46.2 (17.3)	46.0 (17.0)	44.8 (13.5)	43.1
Distribution of hours:								
0-29	32.2	28.0	22.0	25.5	14.6	15.7	13.3	
30-39	20.3	22.6	31.4	21.0	9.4	13.3	13.6	na
40-49	27.4	26.8	25.2	26.2	35.6	32.0	38.6	
50+	20.2	22.7	21.5	27.2	40.4	39.0	34.5	
Self-empl PJ (uninc)	11.1	12.6	10.9	12.5	na	na	3.3	na
Self-empl PJ (uninc, no help)	9.6	10.2	9.9	10.6	na	na	na	na
Occupation:								
managerial	32.4	36.6	34.3	44.0	32.5	41.4	39.9	
clerical	29.7	27.6	30.5	20.6	29.0	26.8	25.5	
sales	9.6	10.5	9.6	10.8	4.3	10.1	7.2	
service	20.3	16.4	16.7	16.9	24.3	15.6	14.3	na
primary	2.5	2.4	3.4	3.1	0.4	1.3	1.3	
processing	2.7	3.0	3.1	1.7	6.0	3.3	6.0	
construction, transportation, material handling	2.9	3.6	2.5	2.8	3.5	1.4	1.9	
Industry:								
agriculture	2.0	3.1	2.8	3.3	0.6	1.4	1.5	
other primary	1.1	0.2	0.4	0.5	0.1	0.3	0	
manufacturing, non-durable	5.1	4.8	5.1	3.3	4.8	4.3	6.2	
manufacturing, durable	1.3	2.3	1.8	0.9	5.3	3.7	4.0	
construction	2.3	2.1	2.4	1.5	0.4	1.5	0.9	
transportation	5.8	5.4	4.2	4.2	5.9	4.1	5.1	na
wholesale trade	2.9	3.5	2.3	2.1	1.0	2.9	3.3	
retail trade	12.8	13.7	13.1	13.8	18.0	19.2	12.8	
finance	7.3	5.3	9.5	4.0	8.9	8.3	6.5	
community services	32.1	32.6	34.8	38.3	42.6	41.4	45.0	
personal services	12.1	13.1	12.8	12.4	5.1	4.5	5.6	
business services	10.0	9.7	6.6	10.4	3.7	4.0	4.4	
public administration	5.4	4.3	4.3	5.2	3.5	4.4	4.8	



Figure 3

# Moonlighting Rates Over Time in Canada and the United States by Age Categories

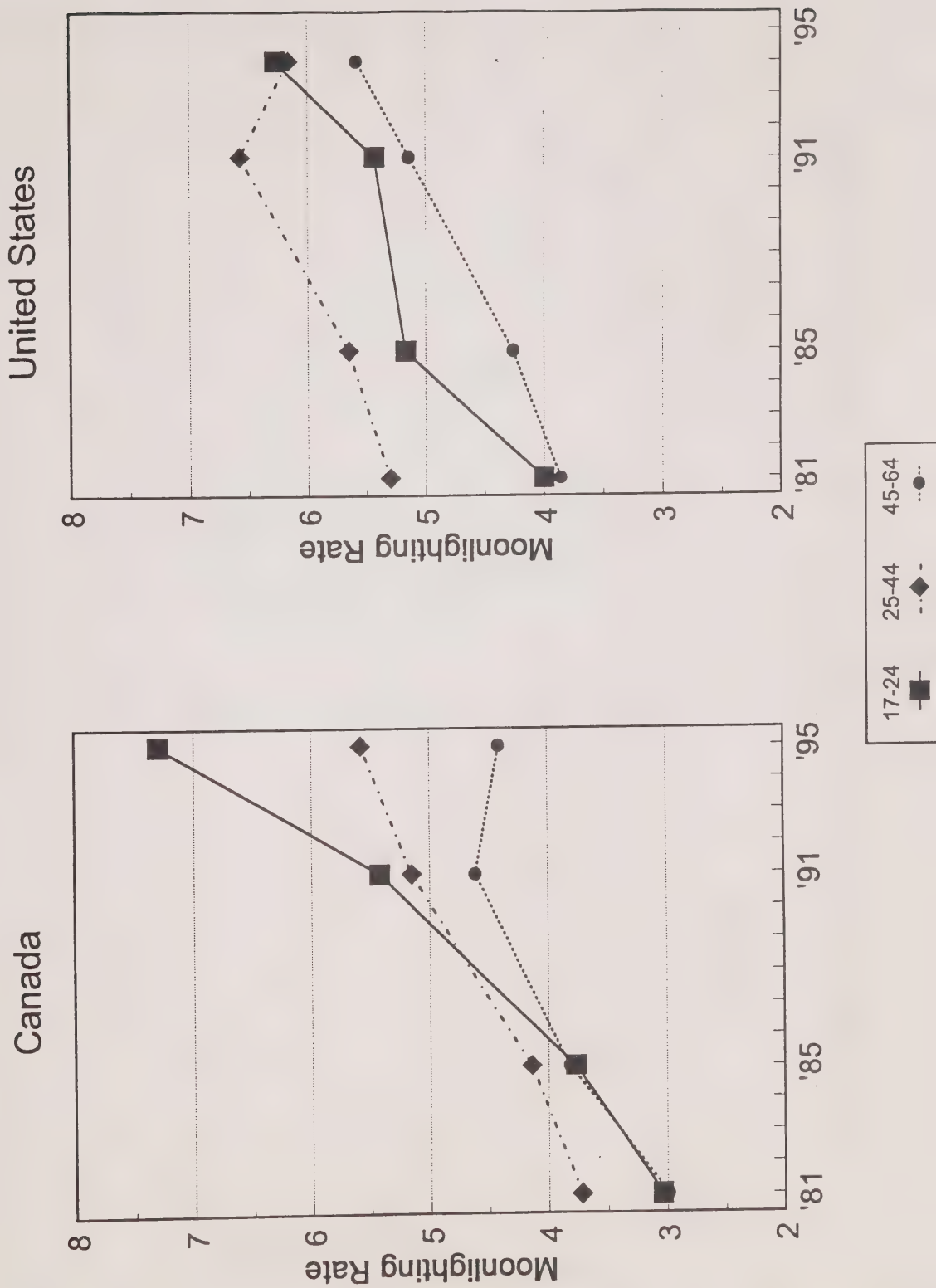


Figure 2

# Moonlighting Rates Over Time in Canada and the United States by Gender

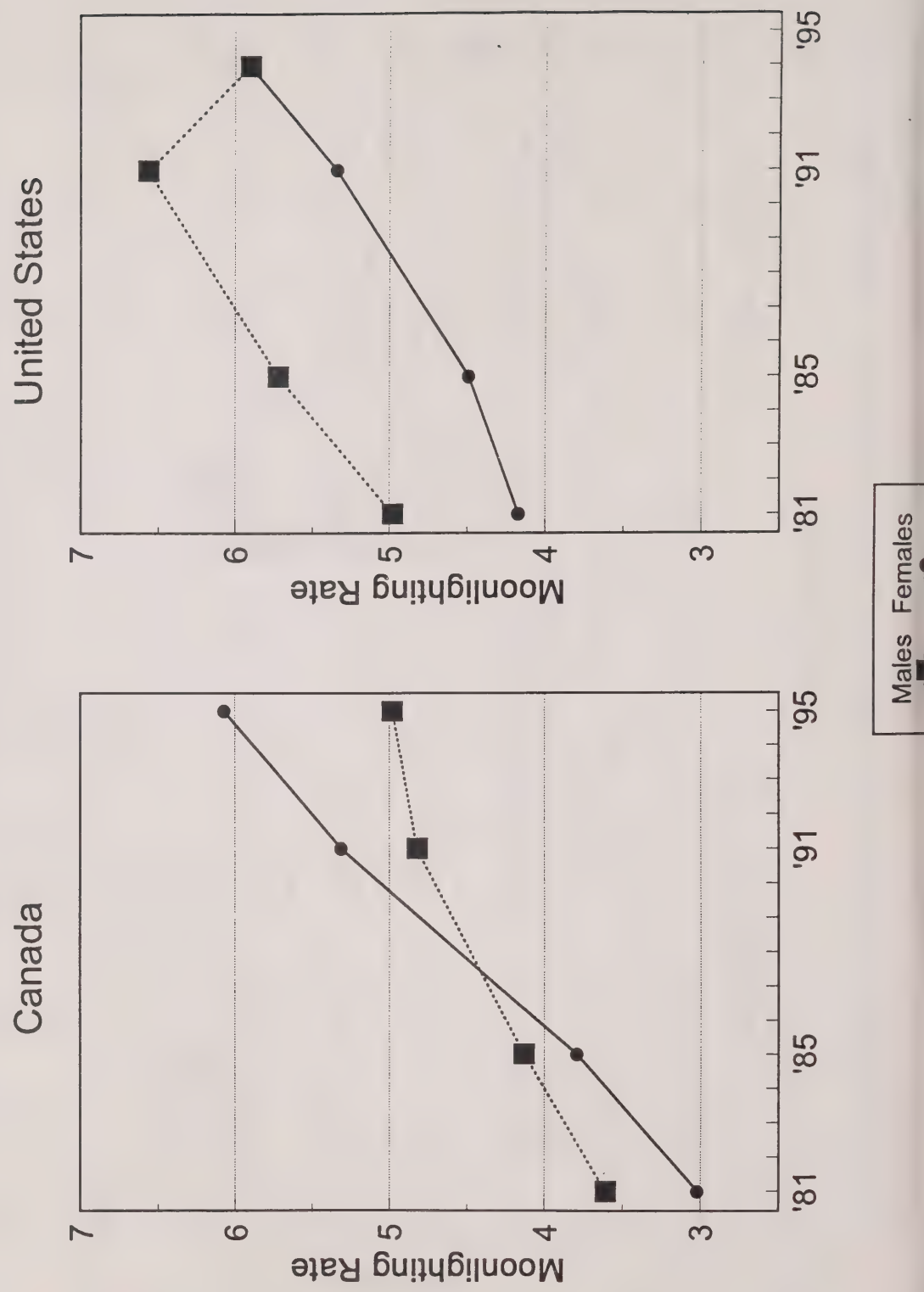


Figure 5

# Moonlighting Rates Over Time for Females

by Age Categories

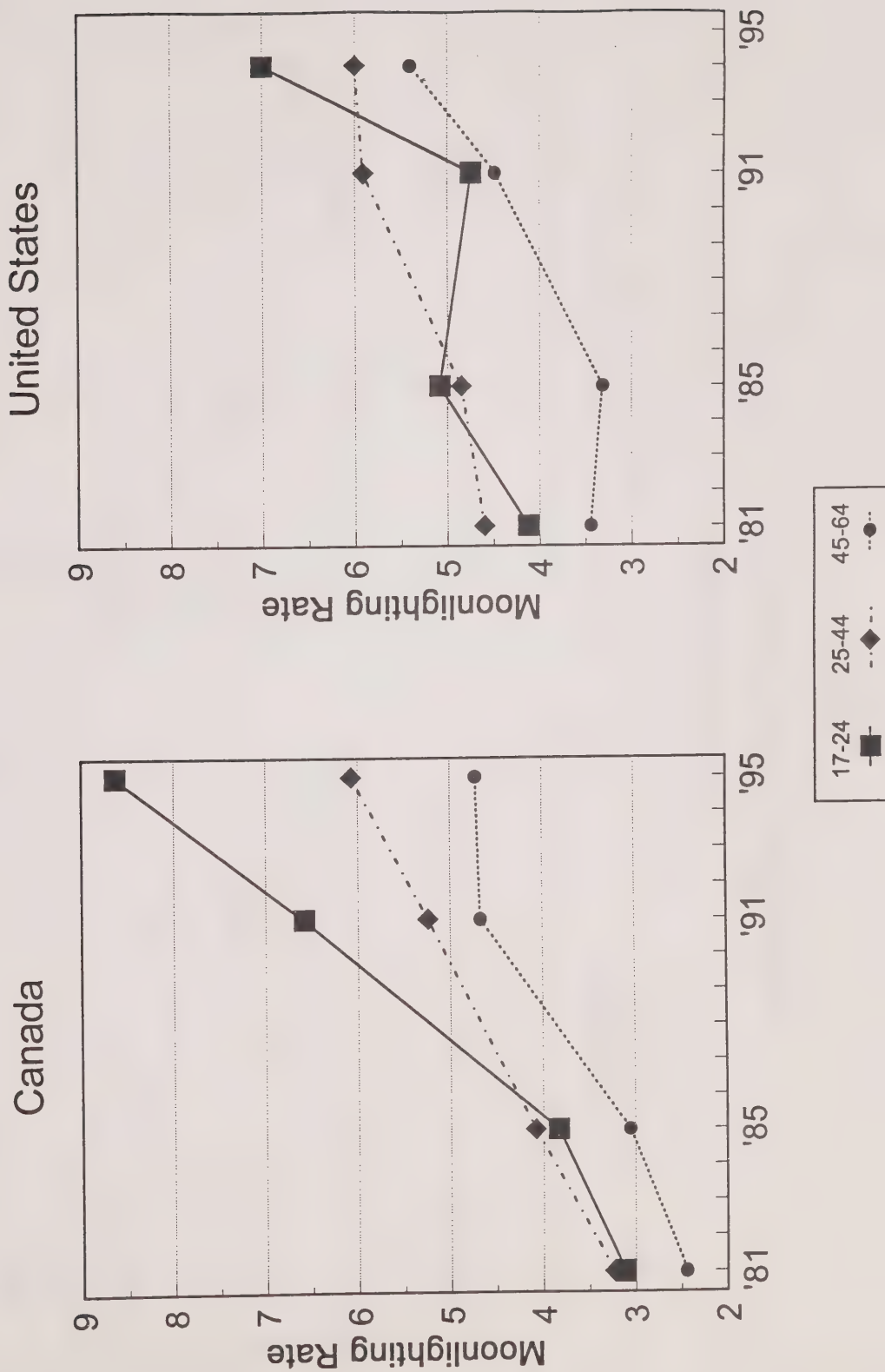


Figure 4

# Moonlighting Rates Over Time for Males by Age Categories

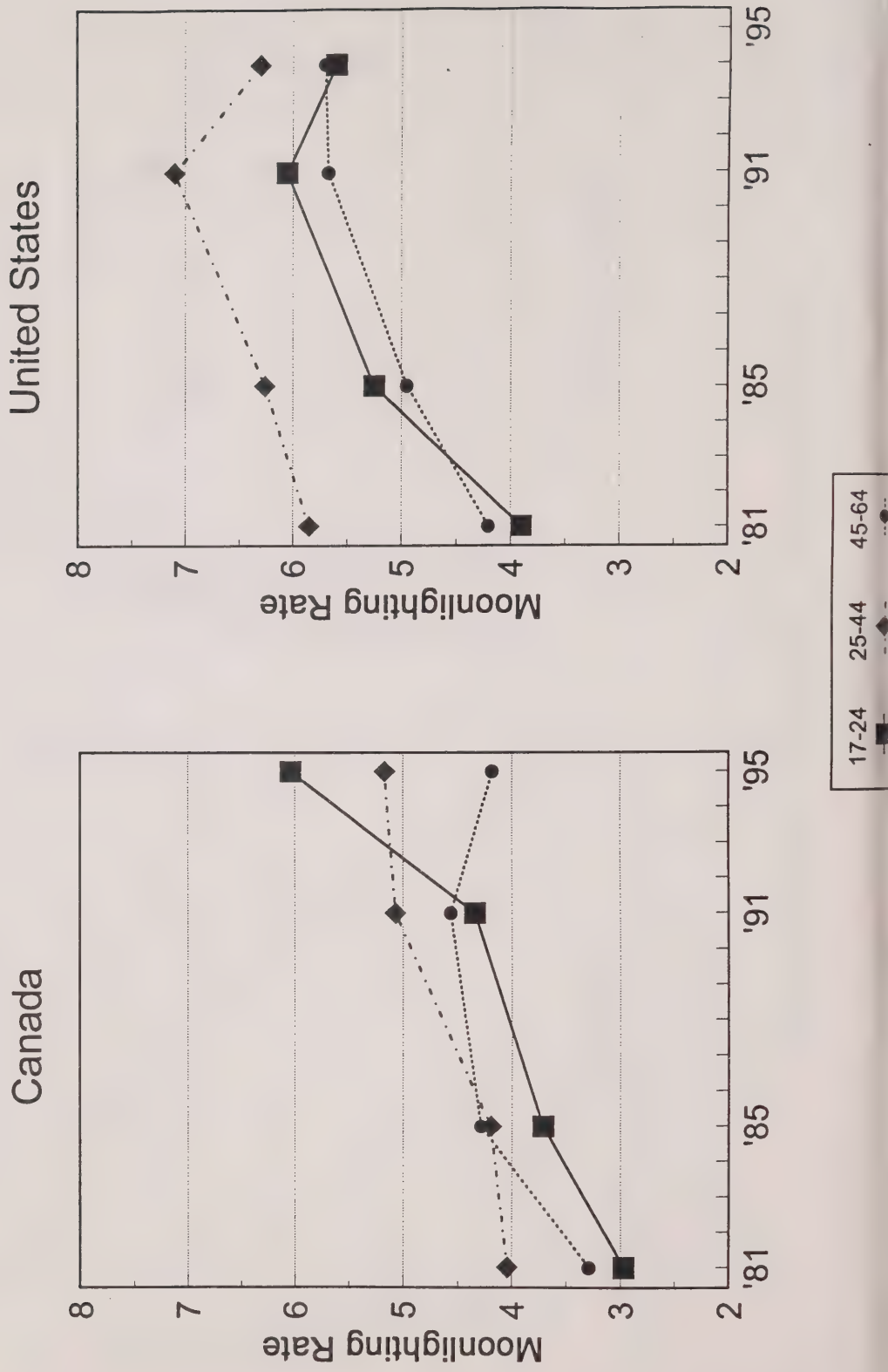
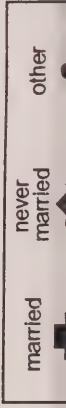
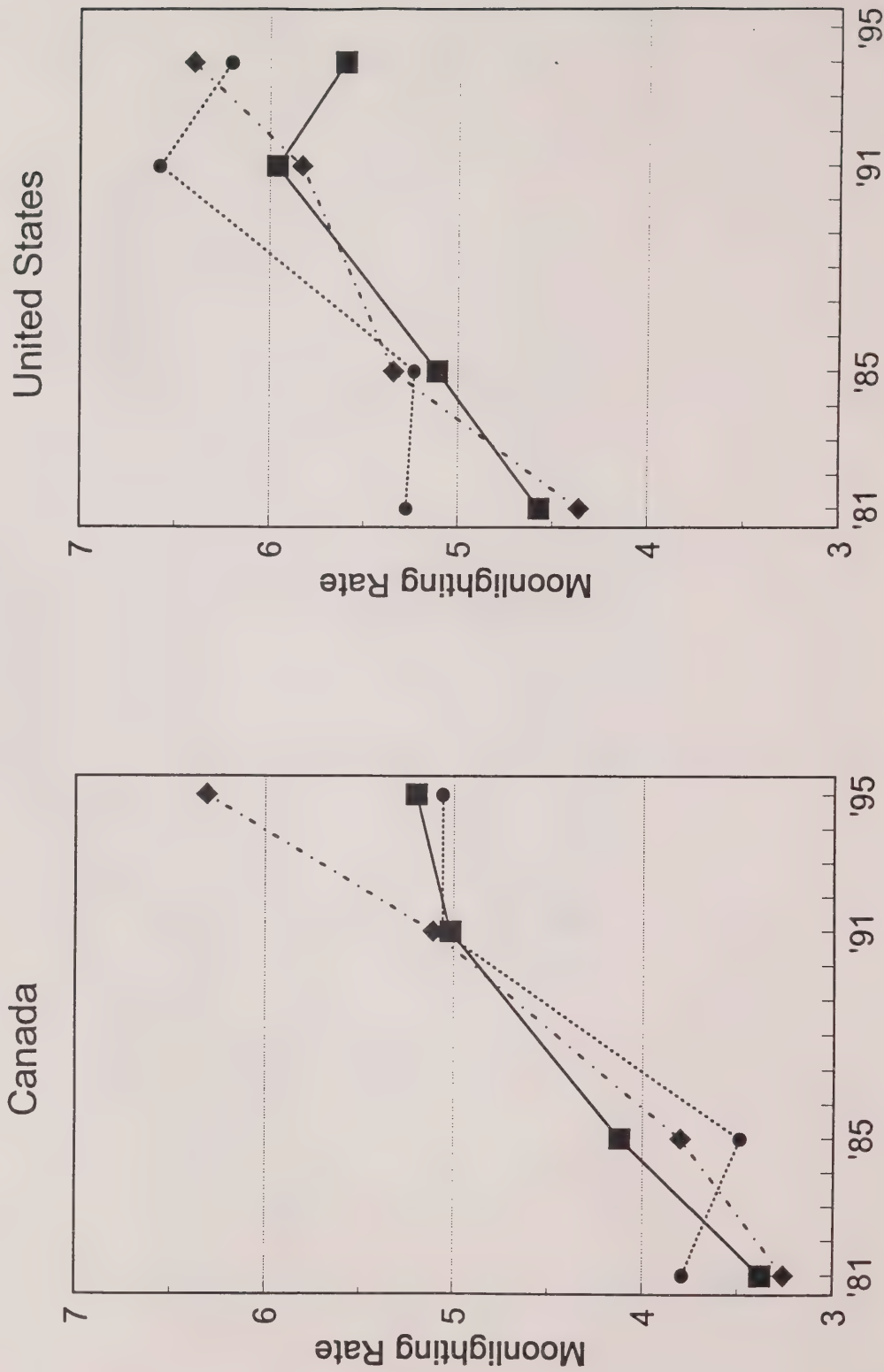






Figure 6

# Moonlighting Rates Over Time in Canada and the United States by Marital Status



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**Changes in Working Time in Canada and the United States.  
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**Session 5 (iv)**

**Measuring the Effects of Short-Time  
Compensation on Workforce Dynamics**

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Karen Needels, Mathematica Policy Research

Preliminary: Not to be quoted or cited without prior permission of the author(s).

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**The Canadian Employment Research Forum (CERF)**  
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Statistics Canada, and the  
W.E. Upjohn Institute for Employment Research.**

REB-3689

**MEASURING THE EFFECTS OF  
SHORT-TIME COMPENSATION  
ON WORKFORCE DYNAMICS**

**DRAFT**

May 21, 1996

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This paper is to be presented at the Conference on Changes in Working Time in Canada and the United States, sponsored by the Canadian Employment Research Forum in cooperation with Human Resources Development Canada, Statistics Canada, and the W.E. Upjohn Institute for Employment Research, Ottawa.





## I. INTRODUCTION

Differences in the dynamics of labor market adjustment between North American and European economies are well-documented. For example, Hamermesh (1993, p. 273) concludes that “nearly all the evidence shows that employment responds more rapidly to output or cost shocks in North America than elsewhere.” Similarly, Burdett and Wright (1989) show that, during the 1970s, less than 10 percent of the variation in labor input in North America was accounted for by variations in hours of work; for a sample of European countries, the figure was consistently above 25 percent and often much higher. As these authors conclude, “Clearly there is *something* going on here.”

What this “something” might be is the source of considerable controversy. One set of explanations focuses on different legal and institutional provisions for layoffs among the economies. Other explanations pinpoint differences in unionization rates or in the skill composition of the workforce. Conclusions from empirical evidence to support explanations remains elusive, however.

Attempts to link the apparent preference of North American employers--particularly U.S. ones--for fluctuations in employment to the characteristics of the unemployment compensation system are most often tied to a series of influential papers written by Martin Feldstein in the mid-1970s (Feldstein 1976 and 1978). Feldstein highlighted two features of the U.S. system that encouraged firms to opt for layoffs during cyclical downturns: (1) Unemployment Insurance (UI) benefits were, at that time, nontaxable to workers who received them; and (2) the UI payroll tax was not fully “experience rated” so that firms did not incur the full costs of benefits paid to their workers. According to Feldstein, these features created a strong incentive for firms to use layoffs to reduce the workforce. The author’s empirical estimates, together with subsequent estimates by others (for example Topel 1983) tended to support the notion that layoffs, especially temporary ones, were correlated with the level of the “layoff subsidy” the UI system provided.

Although Feldstein's argument may partially explain the variation in temporary layoffs among U.S. and Canadian firms, it cannot explain differences between North American and European labor markets in the cyclical patterns of employment and hours. European unemployment compensation systems generally make no attempt at financing through an experience-rated tax, and benefits in Europe are probably subject to lower taxation rates than they currently are in the United States (since such benefits were made partly taxable in the late 1970s).<sup>1</sup>

In an effort to identify other ways in which the American system of unemployment compensation may encourage layoffs, several authors have focused on the way the unemployment insurance systems treat hours reductions. In many European countries, workers who are placed on reduced hours are eligible for a prorated share of their unemployment benefits. Until recently, however, the availability of such short-time compensation (STC) was severely limited in both the United States and Canada. It is possible that European systems encourage a different dynamic adjustment process than the U.S. and Canadian ones. This paper critically evaluates the research that has examined that possibility.

Specifically, our objective here is to summarize and evaluate empirical evidence on the relationship between use of STC and differential patterns of labor market adjustment. Section II briefly discusses the existing theoretical approaches to this topic. Section III describes attempts to develop empirical evidence on conversions between STC and layoffs. We devote considerable attention to evaluating methodologies that have been used for this purpose, because they have yielded widely differing results. Finally, in Section IV, we offer some general conclusions about our state of knowledge on STC-type programs' ability to influence workforce adjustment patterns.<sup>1</sup>

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<sup>1</sup>In subsequent versions of this paper we will be adding an additional empirical section that uses data from the study we are currently conducting on STC usage in five states (for a description of the design of the evaluation, see Berkeley Planning Associates and Mathematica Policy Research 1994).

## II. THEORETICAL MODELING

To understand how employers' and workers' preferences interact when labor input is reduced during periods of changing demand, the development of an employment contract model is required. The approach usually taken in the literature draws on the early implicit contracts model developed by Azanadas (1975). This model views workers and employers as engaged in a bilateral bargaining process. An efficient outcome from the process is a set of choices that maximizes each party's well-being (that is, profits for firms and utility for workers) given the choice of the other party. In its most general form, this model predicts that risk-averse workers will generally prefer hour reductions to layoffs during economic downturns. This preference can be altered by technical aspects of a firm's production and cost functions. For example, if the firm's adjustment costs are asymmetric with respect to changes in hours and employment, different patterns may be optimal. High fringe benefit costs, especially those that are "quasi-fixed," may deter downward adjustments in hours. On the other hand, hiring costs, such as those related to the search for workers or to training and acquiring job-specific human capital, may deter layoffs. Choices may also be affected by imperfect substitutability between hours and employment in the production process.

A few theoretical papers (Wright and Hotchkiss 1988; Burdett and Wright 1989; and Jehle and Liberman 1992) have attempted to explore how the availability of various UI and STC options may affect hours-employment choices. Under a stylized "American" system, UI benefits are assumed to be payable only if the worker is fully separated from the firm. Alternatively, a stylized "European" system of compensation is assumed to provide benefits only for reductions in normal working hours. Models adopting this approach suggest, not surprisingly, that the American system encourages firms to opt for layoffs during downturns in demand, whereas firms operating under a European system, *ceteris paribus*, favor shortened work weeks. In both cases, the work reduction incentives derive primarily from the

incomplete experience rating of UI benefit payments. Hence, some authors favor a move toward more complete experience rating as the primary way to ameliorate inefficient labor input choices encouraged by UI benefits (see, for example, Burdett and Wright 1989).

The all-or-nothing nature of the stylized UI systems in the theoretical literature makes it difficult to apply these models directly to actual data. In Europe, the bulk of UI benefits go to workers who are fully laid off rather than on reduced hours. And in North America, Canada has a national STC program, as do 18 U.S. states.<sup>2</sup> Furthermore, most examinations of firms' adjustment patterns on the microeconomic level, especially in North America, have found that individual firms use both layoffs and work-week reductions to reduce labor utilization (Kerachsky et al. 1986; and Employment and Immigration Canada 1993). Hence, a clear first step in the development of theoretical models that can be estimated from real world data is to generalize the nature of adjustment options faced by the firm.

Adapting these theoretical models to allow UI eligibility for both hour reductions and layoffs seems straightforward, although the published literature has not attempted this adaptation in its full generality. Presumably, such a generalized model would predict that both types of reductions would be encouraged by the availability of benefits, with firms choosing the type of reduction or combination of reductions on the basis of their own cost and productivity considerations.

Differences in the generosity of benefits available under the two unemployment options could also affect observed workforce adjustments, a point made forcefully in the recent paper by Van Audenrode (1994). Indeed, the increased flexibility that a system of compensating both hours' reductions and layoffs might encourage additional compensated unemployment, relative to a system that provides UI eligibility for only one type of workforce reduction.

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<sup>2</sup>Utilization rates for STC have been low under both programs, however. UI programs in the United States also have provisions for the payment of partial benefits, but these benefits are generally unavailable to workers suffering relatively modest work-week reductions.



Aggregate studies of U.S. labor market dynamics over the business cycle provide evidence on this issue. These studies suggest that labor hoarding may have accounted for between four and nine percent of total employment during downturns in demand, probably because of high adjustment costs associated with layoffs (Hamermesh 1993, p. 185). Some portion of this excess labor would probably find compensated hours reductions attractive after STC becomes available.<sup>3</sup> The extent of these incentives depends on variations in fringe benefit costs available from hours reductions and the degree to which STC benefits are effectively experience-rated, among other things. Much of the existing empirical research on STC has not, however, addressed the increasing flexibility suggested by theoretical predictions.

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<sup>3</sup>Studies of the increase in short-time work during recessions provide additional support for the possibility that total compensation might increase when STC becomes available.



### III. EMPIRICAL STUDIES MEASURING THE EFFECT OF STC USE ON WORKFORCE DYNAMICS

Because one of the primary goals of STC is to reduce the number of laid-off workers, most previous researchers have tried to estimate differences in the dynamics of workforce reductions that result from STC usage. Although many different approaches have been taken to analyzing such reductions, we summarize these approaches in what we call the “layoff conversion rate.” This measure reflects the degree to which unemployment compensation under a STC-type program substitutes for unemployment compensation under a regular UI program.<sup>4</sup> A conversion rate of 1.0 (a value frequently assumed in the literature) implies perfect substitution--each hour of STC substitutes for precisely an hour of layoff. Layoff conversion rates greater than 1.0 imply that the compensated unemployment from layoffs avoided because of STC exceeds the compensated unemployment from STC itself. Conversion rates less than 1.0 imply that firms had greater total workforce reductions with STC than they would have if STC had been unavailable.

In reviewing previous research, we focus narrowly on ways in which conversion rates have been treated. Many of the studies we discuss here have contributed significantly to an understanding of the other important issues such as: (1) the effects of STC on employer and employee satisfaction, achievement of affirmative action goals, and worker productivity; (2) the effects of program legislation and administration on STC participation rates; (3) the relative costs and benefits of STC usage to employees, firms, the UI trust fund, and society; (4) seasonal, cyclical, and repeat use of STC; and (5) the use of STC by firms

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<sup>4</sup>In principle, one might want to measure changes in total hours and employment in response to STC use, not simply unemployed hours that are compensated. But the data requirements for a more complete measurement at the level of the firm are quite onerous, and no researcher has attempted such an evaluation. Rather, the existing research has focused on more readily measured compensated hours, usually by drawing data from administrative sources. Although use of the compensated data sheds light on a number of important policy questions (such as the effect of STC adoption on overall expenditures under the UI system), the extent to which these data accurately reflect changes in total hours and employment is not known.

undergoing structural change. We do not summarize research on these issues here, however.<sup>5</sup> Rather, we concentrate solely on the methodology researchers have used to examine layoff conversion rates. Hence, we are not attempting to explore the full social costs and benefits of STC compared to layoffs. For many issues involving STC desirability, however, estimates of the layoff conversion rate play an important, even central, role. For example, measuring any potential social benefit from STC use requires some way of estimating how many layoffs would have occurred in the absence of the program so that the analysis can be conducted on a “per layoff equivalent” basis. Much of the prior research on STC has not been especially careful in adopting such a consistent basis. Our research focus on measurement of workforce dynamics therefore serves to highlight a primary source of the differences in conclusions from previous research.

Experimental studies to determine the layoff conversion rate have not been feasible, so researchers have typically used one of three nonexperimental approaches to estimate the workforce reduction that would have occurred if firms had not used STC: (a) Self-reporting; (b) Assumption of a conversion rate of 1.0; and (c) Samples of matching firms. In the next three subsections, we discuss these approaches and some of the research based on them.

## **A. STUDIES BASED ON SELF-REPORTING**

One way of estimating the number of layoffs avoided because of STC usage is based on firms’ self-reports. This method uses two main data sources: firms’ plan applications and surveys of employers. When a firm applies for STC plan approval, it typically has to specify the number of layoffs that its use of the plan would avoid. Because a firm needs administrative approval for its STC plan to become effective, it may have an incentive to overstate the number of layoffs that would occur if its STC plan is not

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<sup>5</sup>For summaries of many of the other issues that have been addressed in the STC research, see Best (1988) or Cook et al. (1995)

approved. The validity of this counterfactual cannot be tested directly.<sup>6</sup> EIC (1993, pp. 58-59) found that firms typically overstate their planned workforce reductions--that is, the actual reduction is less than the planned reduction. This study also found that a significant number of post-STC layoffs occurred. These factors suggest that using firms' self-reported statements on the number of layoffs that will be averted if an STC plan is approved overestimates the effects of STC on layoff aversion. EIC (1984, pp. 116-118) found that retrospective interview responses on layoffs that would have occurred had STC not been available were 23 percent lower than firms' self-reports of planned layoffs from STC plan applications.

A second source of self-reported information on averted layoffs is the survey data from firms that have used STC, such as that in EIC (1984). These data may suffer from the same problem as self-reported data on STC plan application forms--firms are asked to hypothesize about how many firms they would have laid off had STC been unavailable. A firm might never have laid off any employees (as the "labor-hoarding" literature suggests), and it might also have laid off significantly fewer or more full-time employees than the full-time equivalent (FTE) value of the STC reduction implemented.

Most states with STC legislation have not conducted explicit studies to estimate the number of layoffs averted by STC usage. Their research interests may legitimately focus on other aspects of the impacts of STC adoption. The New York Department of Labor, however, has estimated the number of layoffs averted in each year since 1988. In 1994, for example, 445 New York firms had a total of 9,284 employees on STC plans, which paid out \$3.6 million in benefits. These firms reported that, because of STC use, almost 4,000 layoffs were averted. Using average benefit levels and unemployment durations for laid-off workers, the state estimated that about \$10.8 million was saved in UI benefits in 1994 alone. If we assume perfect experience rating, these results suggest that, on average, firms saved three dollars in UI benefits for every dollar paid out in STC benefits. On its face, this calculation seems implausible and is inconsistent

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<sup>6</sup>A firm may choose not to use its approved plan. State agencies that approve plans do not typically monitor whether plans are used and what happens if they are not used.

with the low observed utilization rates for STC in New York and elsewhere. As we shall see, the result also conflicts with most other empirical evidence on STC.

## **B. STUDIES ASSUMING A CONVERSION RATE OF 1.0**

The second way to estimate the number of layoffs avoided because of STC usage is based on calculating the FTE workforce reduction directly from administrative records (or survey data) on the number of employees collecting STC and their work-week percentage reductions using an assumed conversion rate of 1.0. For example, if a firm has 10 employees on a 40 percent work-week reduction for five weeks, the researcher assumes that the STC plan averted four layoffs, each of a five-week duration.

It is important to recognize that several assumptions are inherent in the “one-for-one” conversion rate assumed in this type of estimation. Most important, the calculation assumes a linearity that often does not exist in either production technologies or employment policies. In standard economic theory, the firm maximizes profits by adjusting labor and other inputs. Because STC may change many factors in the profit function--such as productivity, labor costs, and logistical constraints--it is unlikely that firms would choose the same person-hours of labor input under both shortened work weeks and full time layoffs. Assuming a one-for-one conversion rate suggests that firms are not responsive to the theoretical advantages and disadvantages the researcher is trying to estimate (or that the advantages and disadvantages cancel each other out.) In many situations, however, researchers assume a one-for-one conversion rate primarily because data limitations prevent estimation of the rate directly.

For example, Best (1988) contains a comprehensive and innovative evaluation of California’s STC program and the old Canadian program that seeks to use a variety of data at the firm level. This study presents a good discussion of the factors that can affect the layoff conversion rate--such as firms’ ability to resume production more quickly after a downturn if STC is used, laid-off workers’ tendency to leave unemployment for new jobs, and workers’ tendency to oppose STC less than layoffs. Because he had no administrative data on nonparticipating employers, Best relied heavily on employer and employee survey



data and simulations to derive his estimates. Although he presents information on employers' and employees' perceptions of the work loss from STC relative to work loss under layoffs, he suggests that these data may be invalid because of inconsistencies between the perceptions of the two groups within firms (p. 76). He concludes that using a one-for-one conversion rate is the most reasonable approach, because the data on actual conversion rates are mixed and these rates may vary significantly over time and by other factors unique to an individual firm.

Best also simulates different estimates of the cost of STC relative to the cost of layoffs for the UI system (including both benefits paid and administrative costs). These estimates, ranging from 1.2 to 3.7, depend on the duration of work-sharing plans, the magnitude of the work-week reduction, and the percentage of STC participants laid off after STC.<sup>7</sup> Best acknowledges that most of the scenarios he presents are uncommon, and it appears that the simulation closest to the average work-week reduction, average duration of the reduction, and average post-STC layoffs provides a ratio of the cost of STC to the costs of equivalent layoffs for the UI system of around 1.6. Because this estimate is based on an underlying assumed conversion rate of 1.0, the extra costs from STC arise from such factors as the higher weekly UI benefits of STC recipients, differential treatment of the waiting week under the two programs and the additional administrative costs of STC. The result shows that there can be a considerable difference between conversion rate estimates based on equivalent hours of layoff and estimates based on costs to the UI system.

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<sup>7</sup>Other assumptions pertain to the UI take-up rate of STC participants, the hazard rate to re-employment for laid-off employees, the wages and benefit levels of STC participants, and the costs of processing STC claims. The estimate assumes firms operate at the average values of work-week reductions, STC durations, and post-STC layoffs.



Studies based on aggregate data have tended to use an assumed conversion rate of 1.0 when attempting to estimate the impact of STC usage.<sup>8</sup> This is especially true for studies that have sought to evaluate STC in the European context. For example, Vroman (1992) uses administrative data on STC usage in Germany to estimate what employment would have been in the absence of the program during the period 1970 to 1991. To make that calculation, he simply subtracts “full-time equivalent layoffs” experienced by workers on STC from actual employment data, thereby implicitly assuming a conversion rate of 1.0. He finds that the cyclical behavior of his adjusted employment series has a closer relationship to the cyclical behavior of U.S. employment than the unadjusted series. Hence, he concludes that the greater availability of STC is an important reason for observed European-American differences. The author presents no empirical evidence to support his conversion rate assumption.

The recent study by Abraham and Houseman (1994) of workforce adjustments in Belgium, France, and Germany also at times uses the one-for-one assumption, although the study is not consistent in this usage. In the paper, the authors use a Koyck stock-adjustment framework to estimate speeds of adjustment for aggregate employment and hours at the national and at the one-digit industry level. The innovation relative to the other literature that has used this approach is to adjust the actual aggregate figures to reflect reductions in compensated hours. Differences between the actual and hypothetical data are then used to infer the impact of STC.

For example, in the cases of Germany and Belgium, Abraham and Houseman added compensated short-time hours to actual production hours to obtain series that represent what working hours would have been “without STC.” Because the hypothetical series were estimated to have slower adjustment speeds

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<sup>8</sup>In some cases, effects of STC on aggregate fluctuations make no use of the STC data and therefore need no assumption about layoff conversions. For example, Van Audenrode (1994) finds that total hours exhibit much greater flexibility in European countries with generous STC systems (Belgium, Italy, and Sweden) than in countries with only modest levels of compensation (France and Germany). Although this finding does not provide a direct estimate of the extent to which STC use deters layoffs, it suggests that the trade-off may be significant in certain situations.

than the actual hours series, the authors concluded that STC facilitated adjustments to demand downturns. Implicit in the calculation of the hypothetical series is the assumption that, in the absence of STC, firms would not adjust employment differently than they did in the presence of the program. That is, the layoff conversion rate was assumed to be zero in such simulations. For France, however, aggregate data on hours worked were unavailable, so the authors used employment data instead. In that case, the actual employment data were adjusted by subtracting the FTE of STC hours compensated during the quarter. The new hypothetical series was then interpreted as what employment would have been “without STC.” Hence, the French simulations implicitly assume a layoff conversion rate of 1.0. The authors’ conclusion that the French results support those from Germany and Belgium in showing that STC allows more flexible workforce adjustments is therefore contingent on a very different assumption about layoff conversions. Because of this asymmetry, the overall inferences that can be drawn from the paper about the impact of STC on workforce adjustment during downturns are ambiguous.

## **C. STUDIES USING MATCHING METHODS**

### **1. The Matching Approach**

A third way of estimating the numbers of layoffs avoided because of STC use is based on pairing firms that used STC with firms that did not. Difference-in-differences analysis is used to compare the FTE workforce reductions of the STC firms and non-STC firms over time. The critical assumption in this approach is that non-STC firms do not differ systematically from STC--that is, unobserved differences between the two groups are orthogonal to treatment status.<sup>9</sup>

A growing set of economic literature has evaluated such nonexperimental evaluation (matching) methods (see, for example, Friedlander and Robins 1995; Lalonde 1986; and Fraker and Maynard 1987). Selecting the pool of potential matches on the basis of similarities in time, geographic area, and

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<sup>9</sup>Of course, the reason firms choose not to use STC is of critical importance. Firms that were not aware of STC might be more suitable matches than firms that knew about it and chose not to use it.

observation-specific characteristics is one of the most difficult aspects of matching, and the appropriateness of various criteria for restricting the pool has been debated.<sup>10</sup> For example, researchers may consider limiting the pool of potential comparison firms to those with certain observed levels of compensated unemployment, even though firms which used STC may have chosen not to lay workers off. Thus, researchers who use matching procedures to generate comparison samples may have to make many decisions about what constitutes a good match, without being able to draw on much economic theory as a guideline. Constructing normalizations for comparisons across characteristics is especially important for studies of firms, because many of their characteristics, such as total employment, are highly variable, defining tolerance levels for match quality, and determining strategies to resolve “ties” in matching can make this research as much an art as a science.

One of matching’s main advantages, which has received little attention in evaluations of social programs, is the gain in statistical precision the procedure offers (Snedecor and Cochran 1989). The higher the correlation in the characteristics between treatment (STC) and comparison (non-STC) samples, the lower the standard errors of estimates. To our knowledge, no researchers have examined these efficiency gains from matching STC and non-STC samples.

## **2. Implementation Issues**

The matching procedure has several practical limitations. First, although matching attempts to control firm-specific differences at the outset of the research design, the variables used for matching may not adequately represent all factors affecting compensated unemployment outcomes. The financial health of firms, their labor/management relations, the demand for their products, and their production technologies,

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<sup>10</sup> Economic or operational criteria, such as legislative restrictions on firm characteristics that limit eligibility for STC, may suggest the need to exclude certain firms. In addition, there may be no credible matches for a particular firm (see, for example, Kerachsky et al. 1986 and Schiff 1986).

as well as trends in these factors, may affect whether firms consider workforce reductions.<sup>11</sup> Data on these factors, however, are extremely hard to obtain; even when some of these data are available from administrative databases, they are typically kept in different files and therefore are complicated to extract. Most likely, the variables firms use to make their production (and labor input demand) decisions are known only to the firms themselves. To reduce the effects of any measurable differences in the two samples, regression analyses are typically used to supplement statistical matching procedures.

Second, the treatment variable must be defined carefully. Because firms change their STC status over time, and enrollment can begin at any time, construction of the treatment variable requires focusing on a particular period (the study period). Because comparison firms are chosen to be similar to STC firms, comparison firms are more likely to have participated in STC at times outside the study period than are firms not chosen for matching. Prior participation may therefore bias the treatment effects estimated during the study period.

### **3. STC Studies Using Matching**

The previous study by Mathematica Policy Research, Inc. (MPR) matched STC firms in Arizona, California, and Oregon to non-STC comparison firms on the basis of their size, UI tax rates, and Standard Industrial Classification (SIC) code (Kerachsky et al. 1986). The comparison firms in each state were chosen from among all firms in the state not using STC during the study period. Kerachsky et al. (1986) found widely varying layoff conversion rates across the three study states: California's STC program did not appear to avert any layoffs significantly; Arizona's STC program averted some layoffs, although total compensated unemployment increased for STC firms; and Oregon's program appeared to have an approximate one-for-one layoff conversion rate. No explicit effort was made to exploit the efficiency gains

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<sup>11</sup>Even if additional variables were available, the matching procedure is computationally burdensome and extremely slow.



from matching in this study--the analysis consisted primarily of using regression techniques on a pooled sample of STC and comparison firms.

Although a matching process was used, STC firms seemed to be in greater economic distress because they had somewhat higher levels of pre-STC compensated unemployment. Although the researchers controlled for this factor in most of their analysis, concerns about their ability to control for pre-STC differences in layoff propensities between the STC and comparison groups resulted in some criticism of their findings. These criticisms focused on the finding of no STC impact on layoffs in California and on the possibility that the state of California extracted the data incorrectly (Best 1988, pp. 75-76). Still, the MPR study emphasized the importance of measuring rather than assuming the extent of layoff conversions that STC promises.

The recent Canadian evaluation used a very different methodological approach to matching (EIC 1993). In constructing the comparison group, the researchers chose a random sample from administrative records of employees who had been laid off in 1989 or 1990. The firms from which the employees were laid off were screened to ensure that the comparison firms chosen had been in existence for at least two years and that they had considered laying off 20 percent or more of the full-time employees in a business unit for nonseasonal reasons.<sup>12</sup> Eligible comparison firms could not have used the STC program in the past, and laid-off employees had to have been recalled within 26 weeks. The analysis included a total of 1,080 firms.

Because firms in the STC and comparison samples were not matched according to specific characteristics (except the screening requirement that comparison firms had to have considered laying off employees), the two samples differed markedly along the dimensions that the MPR study used for matching, such as geographic location and industry. Most notably, STC firms were only about one-third

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<sup>12</sup>The authors made no attempt to reweight the sample to adjust for the higher probability of sampling large firms.



the size of comparison firms, on average. Possibly because of these and other differences, many of the results from the analysis of raw data were not supported when regression adjustment techniques were used (p. 40). In contrast to the Kerachsky et al. study (1986), STC firms in Canada appeared to have been in less economic distress than were firms in the comparison group because employees in these firms had significantly lower pre-STC compensated unemployment than comparison firms' employees (p. 154).

Despite using a comparison group for some parts of the analyses, the Canadian evaluation did not directly compare layoffs or total compensated unemployment for STC and comparison firms.<sup>13</sup> To determine the number of layoffs averted because of STC, the ratio of STC participants to plan-reported hypothetical layoffs was calculated for 1989 and 1990. Because the firms included had 177,800 employees using STC during these years, and the firms reported that STC averted 67,500 layoffs, the overall ratio was set at 2.6, although for some simulations the 1990 rate of 2.31 was used instead.<sup>14</sup> These figures, together with information from the comparison sample, provided the basic input into the Canadian evaluation's estimates of UI costs.

Overall, the Canadian evaluation found that STC cost the UI system approximately 35 percent more than an equivalent layoff alternative would have. This estimate was derived through a number of steps that are summarized in Exhibit 8.1 of the project's report (Employment and Immigration Canada 1993). The calculation proceeds as follows. Benefits paid to 1990 STC participants averaged \$1,850, which would yield approximately \$4,281 ( $= \$1,850 \times 2.31$ ) in benefits for each FTE layoff. This value is about the same value as the average benefit--\$4,268--collected by each comparison firm employee. In attempting to

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<sup>13</sup>The analysis on pp. 148-155 indicates that STC claimants collected benefits for fewer weeks than UI claimants, but it appears that adjustments were not made to account for the increased number of claimants under an STC program. Furthermore, compensation under STC was only for the work-week reduction and not for the full weekly benefit amount.

<sup>14</sup>Because this key parameter is drawn from self reports by worksharing firms, the Canadian study might more properly be categorized as utilizing a hybrid methodology that incorporates both self-reporting and matching elements.

estimate the UI expenditures of STC firms if they had laid off workers, the researchers made two adjustments. First, they estimated (from the comparison sample) that seven percent of STC firms would not have laid off workers had STC been unavailable. Hence, the FTE figure was inflated to \$4,581 ( $\$4,281 \times 1.07$ ). The second adjustment sought to control for differences in characteristics between the two employee groups. STC participants were predicted to collect only an average of \$3,446 if they had been laid off, suggesting that the additional compensated unemployment from STC was \$1,135 ( $\$4,581 - \$3,446$ ) per FTE layoff. From these results, the researchers concluded that STC cost the government 33 percent (35 percent once administrative cost differences were included) more than the layoff alternative.<sup>15,16</sup> The researchers stated that the differences probably resulted primarily because (1) 29 percent of participating employees were laid off after their period of STC collection, (2) STC participation does not require the two-week waiting period, while regular UI does, (3) STC recipients were eligible for higher weekly benefit amounts than laid-off employees, and (4) UI is not collected by all eligible laid-off employees.

In summary, the Canadian study represents a hybrid in terms of the methodology used to measure the layoff conversion rate. The basic conversion rate used was primarily self-reported, but many adjustments were made to this rate with information from the study's relatively imperfectly matched control sample. It is interesting that the study yielded cost comparisons that are similar to those reported in the Best and MPR studies.

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<sup>15</sup>Canada's UI system is not experience rated, so higher compensated unemployment charges are not charged to a firm. Because the U.S. system *is* experience rated, albeit imperfectly and with a lag, firms with higher charges typically bear responsibility for them.

<sup>16</sup>For firms, the evaluation's favorable benefit-cost estimates for STC compared to layoffs resulted largely from the significant savings derived from reduced training and hiring costs. For society, the favorable estimates resulted largely from the much lower *stress-related costs* of STC compared to layoffs. These values were calculated on a per-layoff equivalent basis.

#### IV. CONCLUSIONS

In theory, the availability of STC benefits in addition to benefits provided through regular unemployment compensation should affect how firms make cyclical workforce adjustments. Understanding the quantitative magnitude of these effects is an important component in any evaluation of a program's overall desirability. Given the centrality of this issue, we find it surprising that relatively little attention has been paid to the specification of a clear model for estimating these effects. In our view, specifying this type of model should be in the forefront of economic research on STC programs.

Our review of the empirical literature on STC suggests that how program availability affects firms' workforce dynamics is far from clear. Consistent with other evaluations of their type, studies based on self-reporting have produced widely varying estimates, some of which are implausible. Many other studies merely assume the size of an effect that should, in principle, be estimated. Matching methodologies may offer the greatest promise for obtaining estimates of the effect of STC from microdata, but these too face a number of obstacles in implementation and modeling.<sup>17</sup> Probably the most important drawback in such an approach, as in all evaluations that employ a matching methodology, is the lack of assurance that STC users and non-users face similar economic prospects. Although appropriate statistical procedures might ameliorate the biases raised by this problem, there is no guarantee that they will do so. Hence, the suitability of other research designs, such as experiments or carefully designed demonstrations, should be considered.

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<sup>17</sup>We are unaware of any empirical attempts to estimate the layoff conversion rate using aggregate data, although making such an estimate would seem possible if STC usage is fairly prevalent (as in a few European countries).

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## **Session 4B (ii)**

### **The Macro Economy and the Growth of Income and Employment Inequality in Australian Cities**

Robert Gregory, Australian National University

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W.E. Upjohn Institute for Employment Research.**



# THE MACRO ECONOMY AND THE GROWTH OF INCOME AND EMPLOYMENT INEQUALITY IN AUSTRALIAN CITIES

R.G. Gregory and Boyd Hunter\*

Since the early 1970s income inequality among individuals has been growing in most OECD countries. It has arisen from two sources: higher levels of unemployment, especially in Europe, and widening wage dispersions, particularly in the United States (US). Australia has also been subject to these trends and the increasing inequality has led to a fast growing research literature which documents the changes (Gregory 1993, Borland 1992, Saunders 1994).<sup>(1)</sup> The evidence seems to suggest that the change in inequality is less than in the US and the United Kingdom (UK).<sup>(2)</sup>

Since the 1990 Social Justice Strategy Statement (Hawke and Howe 1990) there has also been an increase in research on locational disadvantage. These studies, which usually concentrate on a small number of geographical areas, document how socio-economic disadvantages are exacerbated by where people live. They focus on the level of access to affordable housing, employment, training and education opportunities and physical and social infrastructure.

The best known locational studies include Local Area Research Studies, which considered the experience of ten disadvantaged localities, and The Australian Living Standards Study, which examined the living standards of families in a more diverse group of Local Government Areas. Other publications include the report of The National Housing Strategy (1991-92) and a series of studies on Locational Disadvantage.<sup>(3)</sup>

The locational studies suffer from two disadvantages. First, they are limited in geographical scope. Second, they do not document changes over time. Thus it is not known how general are the findings nor how much circumstances have changed.<sup>(4)</sup>

This paper overcomes these problems. It utilises Census data to emphasise *changes* in income and employment inequality within Australian cities over a fifteen year period 1976 to 1991. It covers over a third of the Australian population. But it too suffers from disadvantages. The Census data cannot be

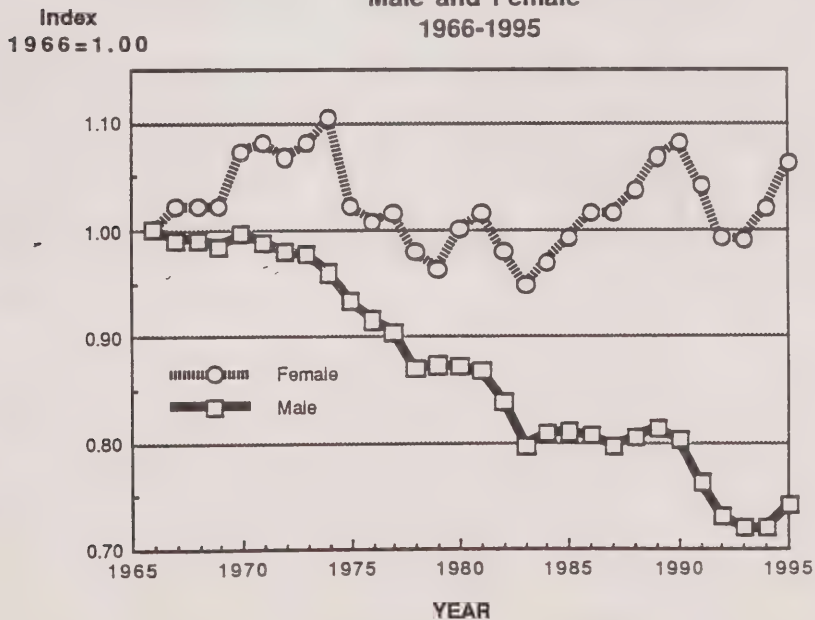


## I The Macro Environment and Increased Neighbourhood Inequality

Some parts of the Australian labour market have performed well over the last two decades. The more successful features include a rapid growth of part-time jobs for women and young people. Some periods also exhibited strong aggregate employment growth, especially during 1983 to 1989 and 1993 to 1995. In addition, after fifteen years of insignificant growth, average real wages have begun to increase again. Although there have been other good changes in the Australian labour market poor outcomes dominate and four adverse features stand out in the period 1976 to 1995.

- First, employment opportunities for men and women seeking full-time work have not kept pace with population growth rates. Some fall in full-time male employment might be anticipated, as more men seek early retirement and younger men stay longer in education institutions. Since June 1976, however, the male full-time employment ratio has fallen 21 per cent which is far above what might have been expected (Figure 1). Unemployment among full-time male workers at April 1996 is 9.7 per cent.

**Figure 1. Full-time Employment-Population Indexes  
Male and Female  
1966-1995**





Young women have also extended their involvement in education but with the reduction in the birth rate, more divorces, postponement of marriage and more women seeking careers in paid employment it might be expected that full-time employment would increase. But at August 1995 the proportion of women employed full-time is only 5.0 per cent more than at August 1976. Unemployment among female full-time workers has increased from 4.3 per cent in 1976 to 8.9 per cent at April 1996.

- The second adverse feature supports the belief that much of the full-time employment reduction was involuntary. During each cycle over the last two decades the number of welfare recipients, such as those who receive unemployment benefits, increased quickly and failed to return to previous levels during the recovery.
- Third, the length of the unemployment spell has increased and Australia has developed a long term unemployment problem. In 1976 the average current spell length of unemployed persons was 17.5 weeks. By 1995 the spell length had increased to 54 weeks.
- Fourth, there is a significant widening of the earnings distribution among those men who have been successful in obtaining full-time employment. Earnings inequality also increased among women (Gregory 1993).

These four adverse features suggest that economic and social inequality widened in Australia and this is what most researchers find for most periods (Saunders 1994; Harding 1995). These studies analyse changes among individuals, and to a lesser extent changes among households or family units. It seemed to us that there should be spatial parallels within major cities where the rich and poor live in different locations.

## II The Growth of Income Inequality Within Cities

### The data

Australia has always had neighbourhoods that are clearly demarcated by income and socio-economic status. Nevertheless, the undesirability and adverse effects of low income neighbourhoods are not stamped on our national consciousness to the same extent that they are often stamped on the consciousness of citizens of other countries. US citizens, for example, are very aware of the poverty of their inner cities and are well aware of the undesirable effects on residents (Wilson 1987; Case and Katz 1991). In Australia the notion of distressed areas is not generally associated with the physical decay and decline of areas but more with the growth of joblessness.

We believe that income and employment gaps between our best and worst neighbourhoods are not as great as the gaps in many major OECD cities.<sup>(5)</sup> We also believe that Australia is not in danger of creating urban problems to the same degree as the US<sup>(6)</sup> but, after the data were assembled, we were surprised at the extent of the changes for the worse that have occurred since the mid 1970s.

The Census is the only consistent data base available to trace changes in neighbourhood inequality over a significant period of time. There are four Census collections which include income data that could be used to measure changes in neighbourhood income distributions. Each Census—1976, 1981, 1986 and 1991—coincided with an economic recession. By some measures, the depth of the recessions at each Census are not too dissimilar, but it is noticeable that the rate of unemployment is subject to an upward trend: 4.4, 5.6, 8.0 and 9.5 per cent respectively.<sup>(7)</sup> Since unemployment is higher at each successive date we cannot use Census data directly to analyse income distribution effects of economic cycles and therefore we emphasise the trend from a comparison of 1976 with 1991.

To conduct the neighbourhood analysis the data are presented as group averages from Collection Districts (CDs) which are the smallest geographical area for which Census data are available. CDs usually contain 200-300 dwellings which are delineated by easily identifiable boundaries. CDs tend to remain unaltered through time and in our sample we exclude those which were subject to boundary changes and not comparable across the four Censuses. The analysis is confined to CDs within major urban areas with populations of more than 100 000.<sup>(8)</sup> The panel consists of 9483 CDs and about six million people in each of the

four years. There are no other comparable data sets which allow such a rich analysis of the changing geographical distribution of economic variables. The results reported here are similar to those derived from Post Code data which, on average, groups CDs into population groups of about 4500 (see Gregory and Hunter 1995a).

Although the Census provides by far the best data they are not ideal. Income data are not available by source. Consequently, it is not possible to investigate directly the role of government welfare payments or other social services. There are no data on taxes paid. Another difficulty is that detailed geographic data are released as grouped means for specific variables and it is not possible for us to reclassify the data in many ways that would improve our understanding.<sup>(9)</sup> Finally, the last Census maps economic circumstances at 1991. More recent data would probably show that the trends we are describing have continued but we will not know until the data from the 1996 Census are released sometime in 1997 or 1998.

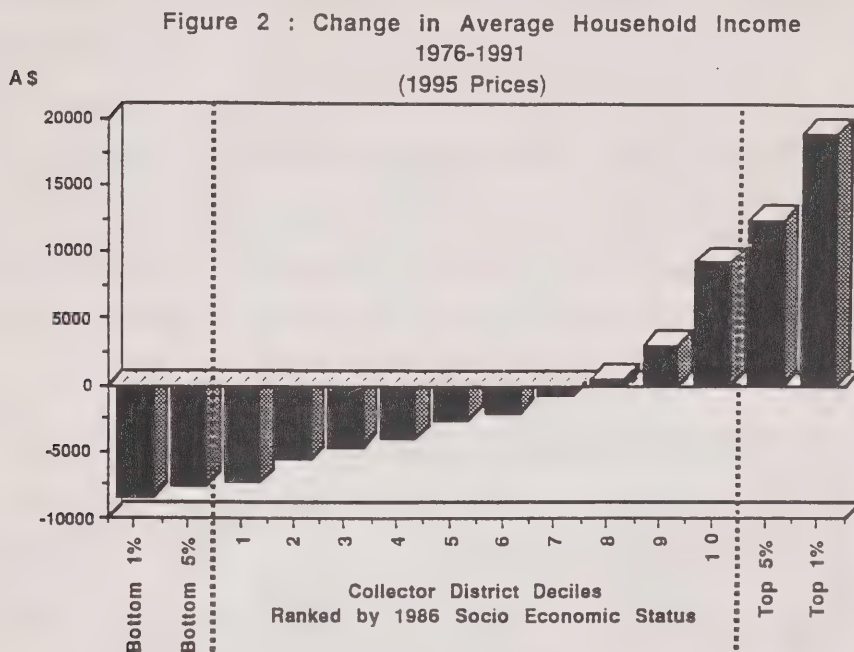
The geographical analysis is based on CDs ranked by socio-economic status (SES). We use the measure of SES calculated by the Australian Bureau of Statistics for 1986 (1990).<sup>(10)</sup> Each CD preserves its SES ranking over the fifteen years. None of the results are affected by the choice of the Census year on which the SES ranking is based.

### **Neighbourhoods and Household Income**

We begin by discussing the marked change in the dispersion of annual household<sup>(11)</sup> income<sup>(12)</sup> across neighbourhoods. In 1976, the ratio of the mean household income of CDs from the lowest to the highest 5 per cent of SES areas was 60.4 per cent. Within the space of 15 years the ratio had fallen to 37.9 per cent. Income distribution has become more unequal and is well beyond that which can be ascribed simply to changes in the structure of households. There is a significant increase in the geographic polarisation of household income across Australia. The poor are increasingly living together in one set of neighbourhoods and the rich in other set. The economic gap is widening.<sup>(13)</sup>

Figure 2 arranges CDs from low to high SES and enables us to identify the pattern of income change across CDs. The CDs are ordered on the basis of their 1986 SES ranking. The first two bars on the left measure the change in mean income over the 1976 to 1991 period for the one and 5 per cent of CDs with the lowest SES. The last two bars on the right measure the change in mean income from the top five

and one per cent of CDs. All other bars refer to the change in annual household income averaged within each CD decile. Average income is in 1995 prices. Each decile includes approximately 500 000 adults.



As we move across the CDs from low to high SES areas, the pattern of income changes is quite smooth. For the bottom 70 per cent of CDs average household income has fallen in absolute terms and is lower in 1991 than in 1976. In areas of the highest SES household income has increased markedly. In the top five per cent of SES areas household income has increased by \$12 555 (23 per cent). In the lowest five per cent of areas household income has fallen by \$7589 (23 per cent). The income gap between the top and bottom 5 per cent of CDs has almost doubled and has widened by \$20 144 (92 per cent).

This very significant pattern indicates that the forces making for increased income inequality across households exert a strong and systematic neighbourhood effect. These forces have either impacted upon individuals, according to the neighbourhood in which they live, and/or there is a continual geographic sorting process at work so that households which lose income are moving to poor neighbourhoods and households which gain income are moving to high income neighbourhoods.<sup>(14)</sup>



The narrow dispersion of neighbourhood household income in 1976, and the increased inequality since then, are so notable that it is perhaps worth re-emphasising both facts by comparing household income from the top and bottom one per cent of CDs ranked by SES. In 1976, the weekly income gap between average household income from the bottom one per cent of CDs and the average household in the median CD was not large (Table 1, Column 1). An additional part-time job for 9 hours per week at \$12 per hour would close the gap.

Facts such as these explain why most Australians believed that they lived in a fairly equal society in terms of income and employment opportunities. By 1991, however, an additional part-time job could still close the gap but it would need to extend to 19 hours per week, an increase of 10 hours. The bottom and median neighbourhoods are drifting apart and the gap has increased from \$116 per week to \$230 (1995 prices).

**Table 1. The neighbourhood household income gap**

	1995 \$A			Per Cent Change		
	First Percentile to Median	Median to Top Percentile	Bottom to Top Percentile	First Percentile to Median	Median to Top Percentile	Bottom to Top Percentile
1976	116	442	558			
1981	175	430	625	51	-3	12
1986	227	620	844	30	44	35
1991	230	854	1084	1	38	28

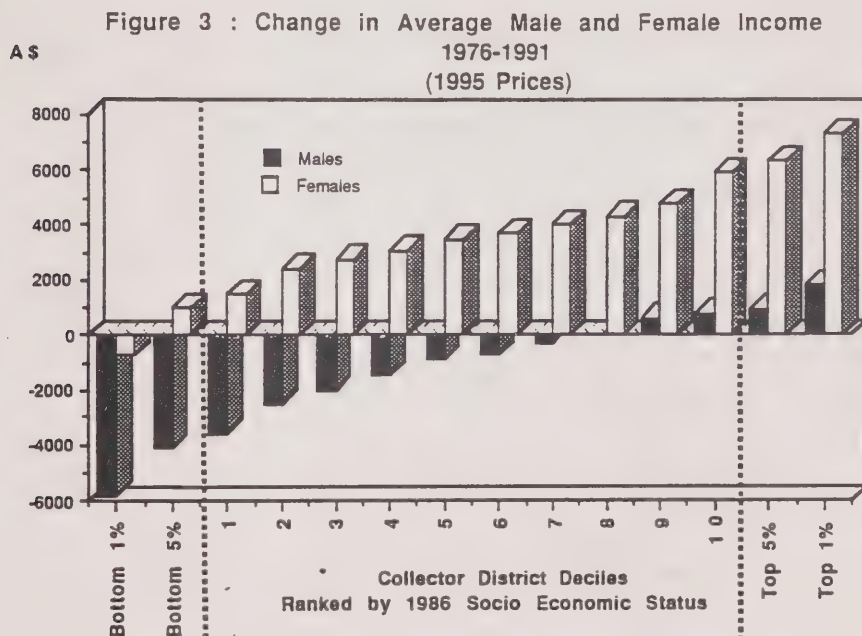
The increased income necessary to move from the average household income in the median CD to the average household income of a neighbourhood in the top one per cent of CDs is larger. The additional income cannot be obtained from the usual part-time job. In 1976, the additional weekly income needed was \$442 and by 1991 this had increased to \$854 a week. This is not a small step. In 1976, the additional income might be earned from an additional job which paid a little less than average weekly earnings. In 1991, the extra annual income required was \$44 408, an income level which far exceeds average weekly earnings.

The increase in income inequality across neighbourhoods continued throughout the 15 years (Table 1, Col. 3) but the principal source of change differed. Between 1976 and 1981 increased inequality was generated by income falls in low SES



neighbourhoods. After 1981, the fall in income continued in low SES neighbourhoods but most of the increase in inequality was generated by income increases in high SES neighbourhoods. The source of the increased inequality appears to have been shifting from large income falls in the low SES neighbourhoods, relative to the median, to large increases in the high SES areas, relative to the median.

Figure 3 documents the change in the male mean annual income of CDs ranked by SES. Between 1976 and 1991 male annual income fell by \$4102 (1995 \$A) in the five per cent of CDs with the lowest SES. In the top five per cent of CDs average male income increased by \$916. As a result, the male mean income gap between CDs from the lowest and highest SES widened by \$5018.



It is noticeable that only 20 per cent of CDs from the highest SES areas experienced male income growth over the 15 years. In 80 per cent of neighbourhoods there were real income falls.

The income changes for women also exhibit a smooth pattern across CDs (Figure 3) but, in this instance, the mean annual income substantially increased in all but the lowest one per cent of CDs ranging from a fall of \$726 for the one per cent of CDs from the lowest SES areas to an increase of \$6321 for the five per cent of CDs

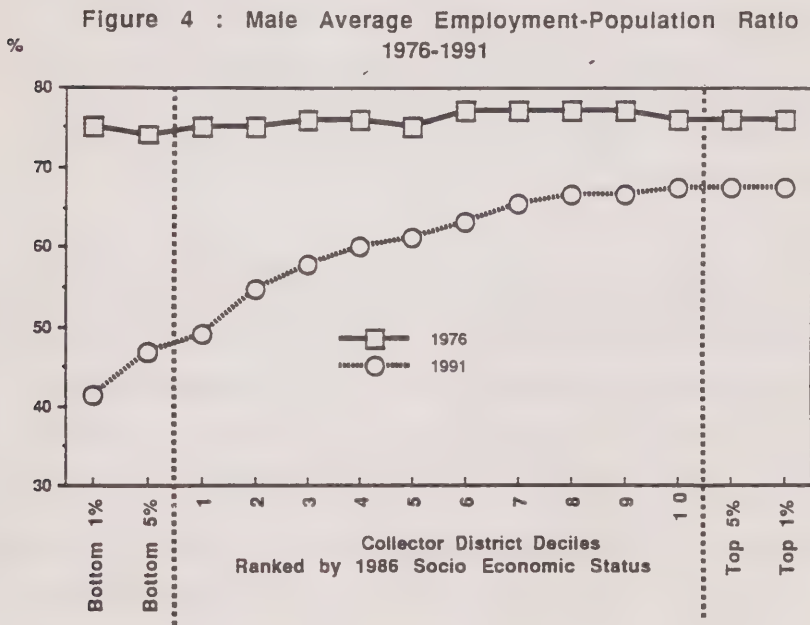
from the highest SES. Women's contribution to the income of a CD has offset the fall in male income, at least in part, in all but the lowest one per cent of CDs.

Income distribution across neighbourhoods has widened for both men and women. In 1976 the average male income in CDs from the lowest five per cent of SES areas was 54.9 per cent of the mean income in the highest five per cent of SES areas. By 1991 this income ratio had fallen to 42.5 per cent; a change not too dissimilar from the change in the household income ratio. The income level of women in the lowest to the highest five per cent of CDs, ranked by SES, has fallen from 78.8 per cent to 57.8 per cent. Once again a change similar to that of the household income ratio.

### III Employment Changes and the Increase in Income Inequality Across Neighbourhoods

#### The change in male and female employment-population ratios

For most households the principal source of income is employment. The relatively narrow income dispersion across neighbourhoods in 1976 was generated by similar employment-population ratios across neighbourhoods. For men there was no systematic variation in employment-population ratios across CDs ranked by SES (Figure 4). For women, the employment-population ratio in 1976 was marginally less in low SES CDs and the employment-population gap between the lowest and highest 5 per cent of neighbourhoods was small (Figure 5).



In 1976, irrespective of where they lived, Australians shared much the same commitment and access to employment. A social observer could walk across the best and worst parts of Australian urban areas and although the probability of meeting some one who was employed differed by neighbourhood there was no systematic change by socio-economic status. Income inequality across neighbourhoods ranked by SES was generated by different levels of income from all activities and not from differences in the proportions of the population employed.

By 1991, circumstances had changed dramatically. Australian employment growth between 1976 and 1991 had been very poor. Unemployment increased from 4.7 to 9.5 per cent.<sup>(15)</sup> The poor employment performance is evident in the neighbourhood data. In all neighbourhoods the employment-population ratio for men had fallen: by 9 per cent in CDs from the top 5 per cent of SES neighbourhoods and by 37 per cent in CDs from the lowest 5 per cent of SES neighbourhoods.

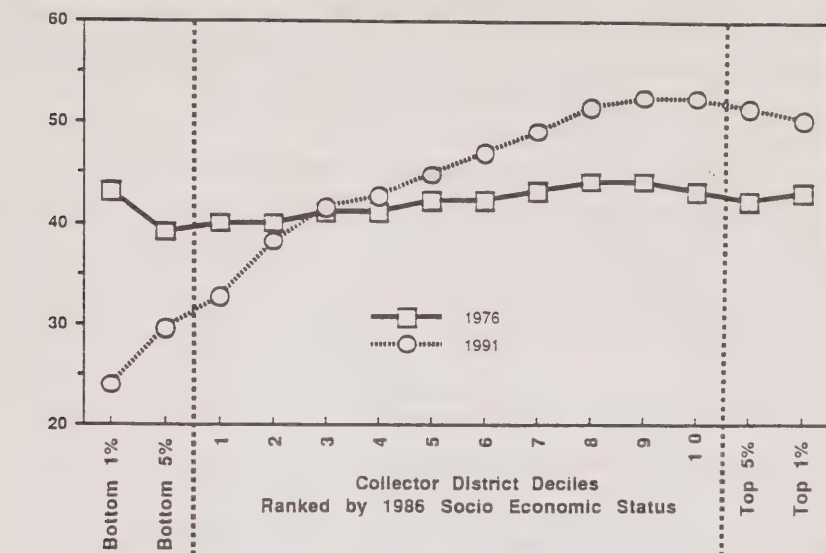
The pattern of employment change for women is similar but the contrast across neighbourhoods is greater. For the top half of neighbourhoods the proportion of women employed increased approximately 16.2 per cent. For the bottom half of neighbourhoods the proportion fell by 3.0 per cent. For the bottom decile the fall was 17.5 per cent. We are so used to seeing macro data which indicate a rapid growth of part-time work for women, and reading about women's increased labour force involvement, that it is a shock to see that in 1991, and for half of Australian neighbourhoods, the average proportion of women employed in the labour market is less than in 1974.

The growth in the women's employment-population ratio is concentrated in the high SES areas. By 1991 the probability that a women would be employed if she lived in the top 5 per cent of SES neighbourhoods was 78 per cent more than if she lived in the lowest 5 per cent of SES areas. The next step in the research agenda will be to explain this change. Some factors to consider would be the growth in numbers of sole parents—who tend not to be employed and who are increasingly concentrated in low SES neighbourhoods, the very marked tendency for the partners of unemployed men to also be unemployed, and the potential, if any, for non reporting of employment activities among those dependent on welfare.

It is apparent that employment-population ratios are now a major contributor to income variations across areas. For males, Australia has returned to the neighbourhood employment patterns of the 1930s, with substantial pockets of non-employment. For women however, the pattern is quite different (Gregory et al 1987). In the 1930s there was little variation of female employment-population ratio across neighbourhoods ranked by SES. The pattern was much the same as in 1976. The loss of women's employment in low SES areas needs to be better understood.



Figure 5 : Female Average Employment-Population Ratio  
1976-1991



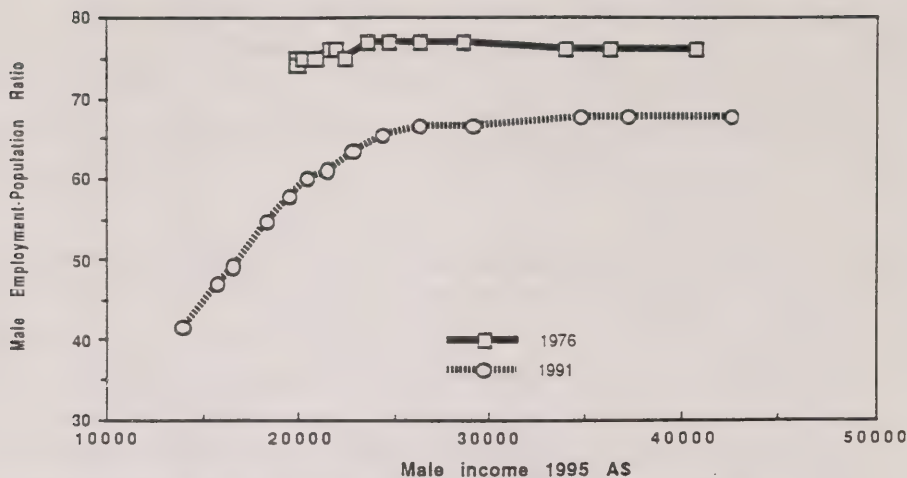
### The new face of Australian cities

Neighbourhoods in 1991 can be divided into two groups. For neighbourhoods taken from the top 20 to 30 per cent of CDs, ranked by SES, the employment-population ratio of men and women does not change significantly across neighbourhoods and there is no close relationship between employment level changes and income changes (Figure 6, Figure 7). Income dispersion within this group is related more closely to variations in wages and salaries, and earnings from own business rather than variations in employment rates. For our social observer walking through the top 20 to 30 per cent of neighbourhoods the *level* of employment has changed since 1976 but the pattern of employment across CDs has not. Employment-population ratios continue *not* to vary systematically across neighbourhoods by SES and not to be related to income changes.

For the remaining 70 to 80 per cent of neighbourhoods employment rates now matter. The world has changed and there is now a clear association between employment changes and income changes. Within this group the translation of employment changes into income changes is similar for both men and women. On average an increase in employment of 15 percentage points adds \$2300 to male income (Figure 6) and \$2816 to female income of a neighbourhood (Figure 7).

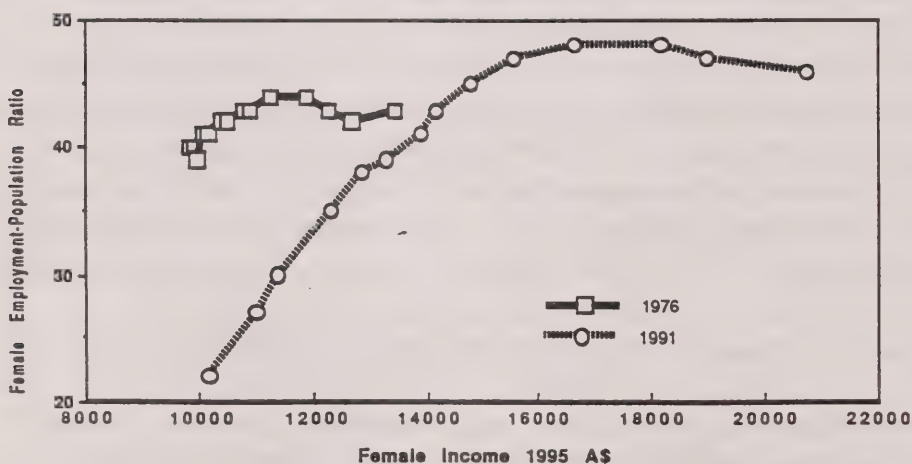


Figure 6 : Male Average Income and Male Employment-Population Ratios



From left to right the points represent the male mean employment-population ratios and income of the bottom 1% and 5% of Collector Districts, then Collector District Deciles, and finally the top 5% and 1% of Collector Districts. The data are taken from Figures 3 and 4.

Figure 7 : Female Average Income and Female Employment-Population Ratios

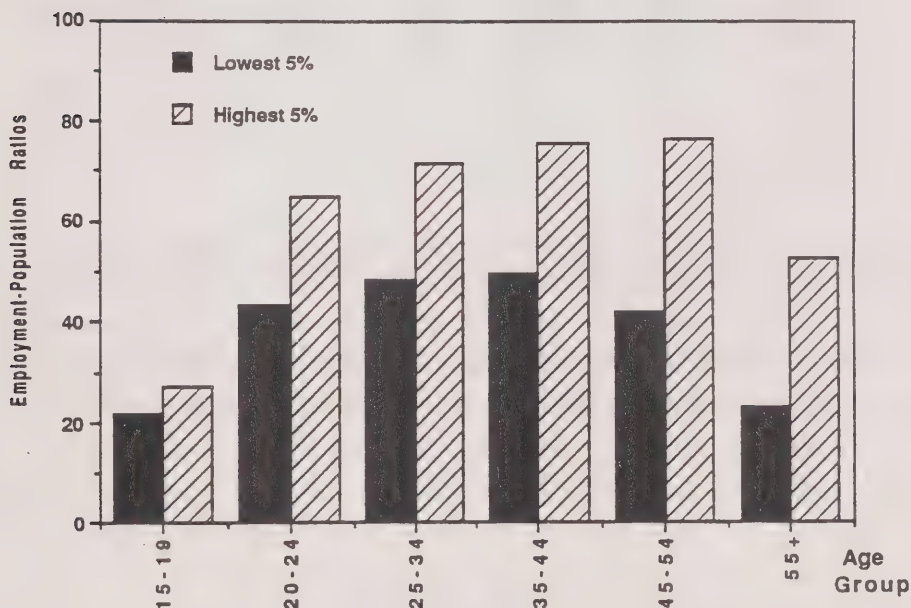


From left to right the points represent the female mean employment-population ratios and income of the bottom 1% and 5% of Collector Districts, then Collector District Deciles, and finally the top 5% and 1% of Collector Districts. The data are taken from Figures 3 and 4.

The widening of the income distribution across neighbourhoods is being driven by different influences at different ends of the income distribution. Employment is strongly associated with income in low income neighbourhoods but not in high income neighbourhoods.

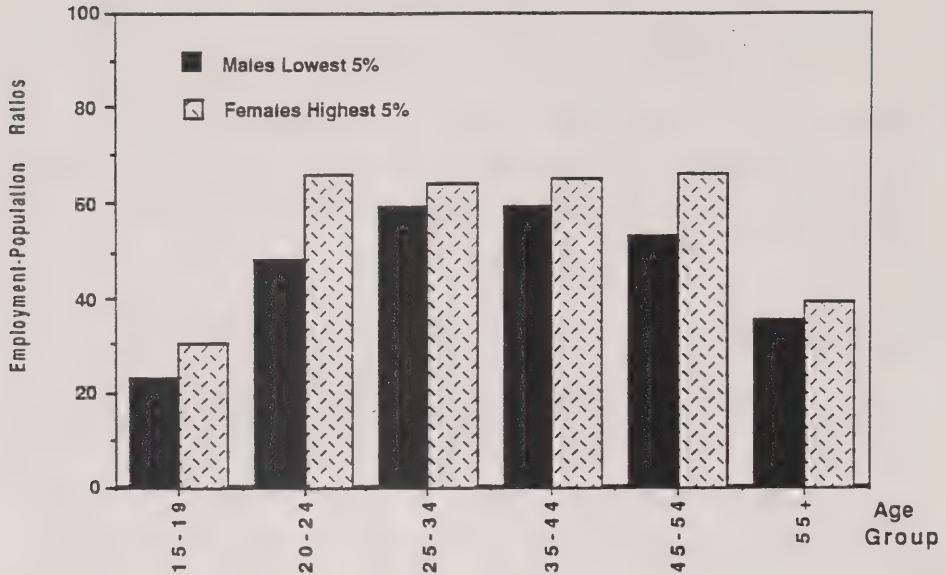
Joblessness in low SES areas begins with teenagers (Figure 8). In 1991, the employment rate of teenagers in low SES areas is 80 per cent of that of high SES areas, even though most teenagers in high status areas are attending an education institution. Within the age group 20 to 24 years the employment rate of the bottom 5 per cent of CDs has fallen to 63 per cent of that of the top 5 per cent of CDs and remains there until the age group 45 to 54 year old where the employment rate falls further.

**Figure 8 : Employment-Population Ratios  
All Persons by Age  
Lowest and Highest 5% of SES Areas, 1991**



The pattern is the same for men and women. It is remarkable that in 5 per cent of CDs from the low SES areas that almost one half of the men 25 to 44 years are not engaged in employment. Indeed, the employed proportion of the male population of low SES areas in every age group is lower than the employed proportion of females from high SES areas (Figure 9).

Figure 9 : Employment-Population Ratios  
 Males Lowest 5% of SES Areas  
 Females Highest 5% of SES Areas  
 15 years and over, 1991



The rate of joblessness among residents of a CD can usually be explained by human capital characteristics, country of origin and usual industry of employment. It is noticeable, however, that among the bottom 10 per cent of CDs in 1986 there appears to be other factors at work which impact negatively on employment. These additional locational specific factors were not evident in 1976.

#### IV Conjectures as to the Causes of Increased Urban Inequality

Although we are very concerned about the rapid growth in income inequality across neighbourhoods it is nevertheless true that there is no 'right' degree of urban inequality. Nor is it clear that policy can efficiently and effectively achieve the urban inequality we might prefer. In the past Australia has not placed high priority on policies specifically directed towards reducing urban inequality and our experience of policy effectiveness in this area is limited. Policy has been more concerned with income distribution and unemployment among individuals. It has been implicitly based on the premise that if inequality is reduced among individuals it will be reduced across urban areas. This premise seems incorrect. There has been no 'trickle down' of macro economic growth to the unemployed and low income earners in low SES areas between 1976 and 1991. What might be done if we are dissatisfied with a situation where, in 1991, male unemployment is as high as 35 per cent in many neighbourhoods? How might we return to something approaching the distribution of neighbourhood income in 1976?

It is not possible to answer these questions without some understanding as to the underlying causes of the growth of urban inequality. There is a range of possible causes and we are not sure of their relative importance. We focus on four.

##### **Manufacturing decline and the interaction of real wages, welfare benefits and transport costs**

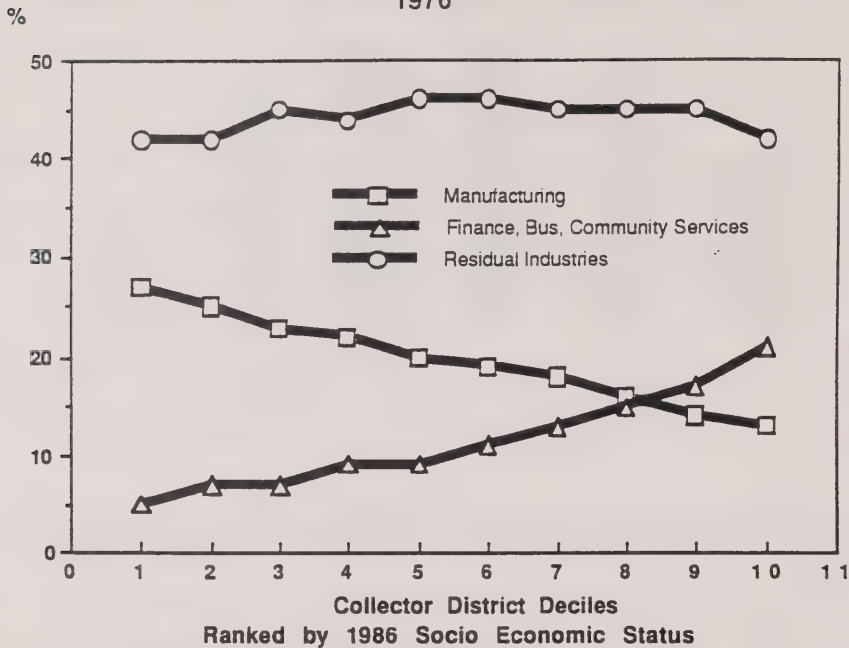
A glance at the 1976 Census data is sufficient to indicate that some of the preconditions for important regional shocks existed *within* cities. To illustrate this we divide industry of employment into twelve two-digit Australian Standard Industrial Classification categories and focus on the male labour force. Similar considerations apply to the female labour force.

Figure 10 plots the proportion of men over 15 years of age who were employed in manufacturing within each CD in 1976. The horizontal axis orders CDs by their 1986 SES rankings. The data are presented as the mean of each SES decile. Individuals are classified by area of residence and not by location of employment.

There is a distinctive pattern. In CDs from the bottom SES decile 27 per cent of all males over 15 years of age were employed in manufacturing. As the SES of the area increases the manufacturing employment proportion falls reaching 13 per

cent in areas of high SES. Figure 10 also includes 1976 male employment in Finance/Business and Community Services. Six per cent of men over 15 years from the bottom SES decile are employed in these industries. In areas of high SES these two industries employ 23 per cent of all men. Employment in the other nine industries, which we label the Residual category, exhibit no noticeable and systematic pattern across SES areas.

**Figure 10 : Proportion of Males Employed  
by Industry Group  
1976**



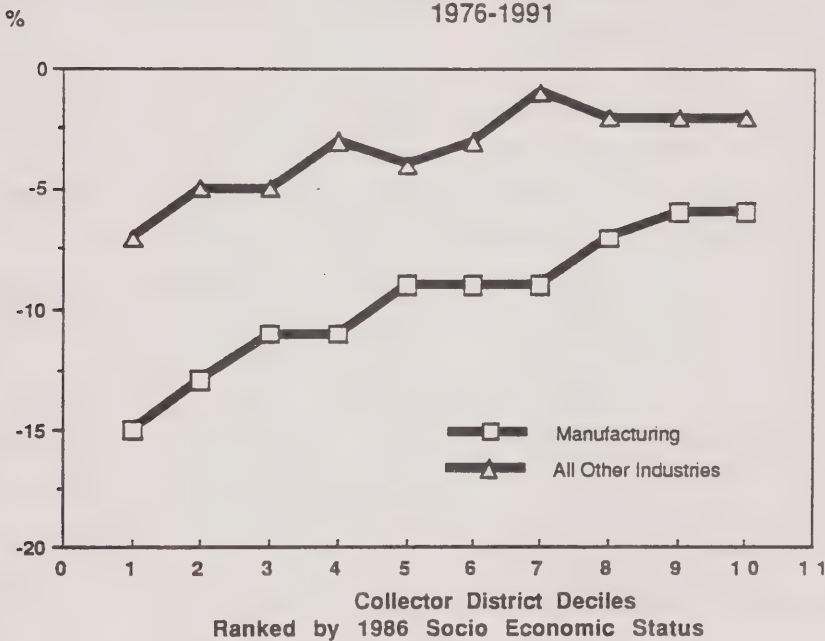
Between 1976 and 1991 there was a large negative macro shock to manufacturing and male manufacturing employment, as a proportion of the male population over 15 years of age, fell 37 per cent. Low SES areas were badly affected. Employment in manufacturing fell in the lowest decile by 15 men per hundred over the age of 15 years (Figure 11). The fall in the top decile was much less at six men per one hundred.

Labour market changes in other industries did not help the employment adjustment that was required. Employment in the Residual industry category, as a proportion of men over 15 years, fell 14 per cent and did not provide opportunities for net job growth. The pattern of decline was much the same



irrespective of the SES ranking of the neighbourhood. The only significant source of male employment increase, 29 per cent, was in Finance/Business and Community Services, where employment change favoured high SES areas. The net result is that male manufacturing employment loss in low SES areas was not offset. Men who live in low SES areas were not able to make employment inroads into other industries.

**Figure 11 : Change in Proportion of Males  
Employed by Industry  
1976-1991**



It is perhaps not surprising that job loss was spread unevenly across CDs and fell disproportionately on areas where manufacturing employees live; this is to be expected given the initial employment pattern. The interesting point is the spatial nature of the persistence of joblessness. What could be the mechanisms generating these outcomes? One possibility is the following.

Suppose that as a rough approximation Finance/Business and Community Services tend to locate in the city centre or in local shopping and business areas that are easily accessible to all potential employees. Transport routes are focussed on these locations. Industries in the Residual category are spread randomly throughout the community and therefore jobs are easily accessible as well.

Factories, however, are clustered and not spread evenly throughout the city but are close to low SES areas where the majority of their workers live.

If this description is broadly correct then when factories close they create local areas of unemployment. There are Residual industry jobs nearby but the total number is contracting. The expanding Finance/Business and Community Services sectors are located in areas which involve greater transport costs and, in addition, the job growth in this sector has not been sufficient to absorb the manufacturing job losses. The persistence of the geographical dispersion of unemployment arises because of the combination of the industry pattern and geographic location of the lost jobs.

The persistence elements of the analysis can be reinforced by other changes that are occurring in the economy. Suppose, at the same time factories are closing, that welfare payments for non-work are increasing in real terms, transport costs are increasing in response to the movements towards less subsidies and real wages are falling among low-paid workers. Lower real wages offered to those at the bottom of the wage distribution may encourage some people to remain in a job loss area and live on unemployment benefits, rather than to accept employment at lower wages and incur higher transport costs. Furthermore, if house prices and rents respond to the lack of work in particular parts of the city then the effects of regional specific shocks will be increased. A wider variance of rents, reflecting a change in the ease of finding employment from each geographic base, may encourage people to stay unemployed and pay low rents rather than move to a high rent area and accept a low paying job.<sup>(16)</sup>

If mechanisms similar to this are generating unemployment persistence in areas where manufacturing workers used to live then a number of important points follow. First, the unemployment problem cannot be solved by macro policies which do not create a job bias towards those areas. Second, trends in the key variables—increased transport costs, increased welfare payments relative to wages at the bottom of the wage distribution and a falling proportion of employment in manufacturing—seem likely to continue or at least seem unlikely to be significantly reversed. Hence, in the absence of some intervention unemployment may continue to persist on a geographical basis.

This simple analysis of persistence suggests that our future research should look closely at access to transport services, travel to work data and the location of factories. Other researchers have focussed on transport disadvantage and that

would need to be integrated here. The other research task is to consider whether individuals are responding in sufficient numbers to these changes to contribute significantly to unemployment persistence.

Finally, within this type of model lower wages in low SES areas offers to the unemployed may exacerbate the situation. Lower wages may have two countervailing effects: they may create jobs but reduce the willingness of those who live in low SES areas to travel and accept these jobs. The withdrawal of labour supply in low SES areas may well dominate. Lower wages would need to be accompanied either by generation of jobs close to the depressed areas or by reductions in unemployment benefits that encourage people to stay where they are. Experience with inner city poverty and unemployment in the US suggests that low wages do not cure the problem.

### *The decline in demand for unskilled labour*

Another important influence that could be generating the growth of joblessness in low SES areas is that the demand for labour is moving away from unskilled workers towards workers with skills and education. The unskilled live in low SES areas and the skilled in areas of high SES. Inspection of Figures 10 and 11 suggest that the greatest job losses occur where there is a concentration of manufacturing (Figure 11). Job losses in other industries also show a systematic relationship with the SES of an area but the relationship is not so marked or so large. A structural explanation which emphasises manufacturing decline seems better than an explanation which emphasises the decline in the demand for unskilled workers across all industries.<sup>(17)</sup> Of course both influences may be at work.

### *Public housing policy*

Approximately 5 per cent of the population live in public housing which, by and large, is concentrated in areas of low SES. Access to public housing has become increasingly directed towards the poor and economically disadvantaged. As a result urban inequality has increased

The typical public housing resident has changed considerably over the 1976 to 1991 period. To demonstrate this we constructed a special sample of neighbourhoods where the proportion of individuals in public housing exceeded

50 per cent. Table 2 shows the income change in public housing areas that are located in the bottom 10 per cent of SES CDs. Over this period the average real income of a male public housing resident fell 29 per cent. The average income of a male in non-public housing neighbourhood in the bottom 10 per cent of SES neighbourhoods fell 13 per cent. Women who live in areas of high public housing concentration have also done less well.

Employment changes were also very large and negative in public housing. Employment of men and women in public housing fell 42 per cent and 30 per cent respectively. In non-public housing the employment of men fell 24 per cent and that of women fell by 5 per cent.<sup>(18)</sup>

In neighbourhoods in the bottom 10 per cent of SES areas without public housing all the general characteristics described earlier are still apparent but the extent of the falls has been moderated somewhat. Public housing policy, which has increasingly grouped low income people together, has contributed to the falling income in low SES areas but is only a part of the story.

**Table 2. Change in employment and real income in public housing neighbourhoods and other neighbourhoods in the bottom 10 per cent of SES rankings - 1976 to 1991**

	Public Housing*	Neighbourhoods No Public Housing %	All %
	%		
Real Income			
Male	-29	-13	-18
Female	-2	17	13
Personal	-19	-1	-7
Household	-34	-12	-21
Employment			
Male	-42	-24	-29
Female	-30	-5	-11
Total	-37	-15	-22

\* Public Housing Neighbourhoods: 50 per cent or more of the neighbourhood population residing in public housing. There are 207 Public Housing neighbourhoods in the sample.

### *General macro influences*

Increasing inequality may also be the result of major structural problems in the macro economy—such as emerging inflation or balance of payment difficulties—



that lead to insufficient job creation. Irrespective of the initial nature of the adverse macro employment shocks those with more skills find jobs quickly and displace the least skilled who eventually become unemployed. The unemployed gradually sort themselves geographically so that eventually more and more of the jobless live in depressed areas where the rents are lowest.

This explanation would suggest that the correlation between the decline in manufacturing employment and job loss by area is of no special significance. When the economy recovers and sufficient jobs are created the up-draft draws individuals from low SES areas back into employment.

One piece of evidence that might support this view is that according to Census data approximately 40 per cent of males living in a CD were not resident there five years earlier. This mobility raises the possibility that males who lose their jobs in manufacturing leave the CD and are replaced by others who are unemployed but not necessarily as a result of manufacturing decline. To confirm this we need to know the SES status of the areas where individuals move to and come from but the Census does not provide this information at the detailed level at which this analysis is conducted. This is an important piece of missing data. It may be possible to look more closely at mobility at higher levels of spatial aggregation (Gregory and Hunter 1995b).

If individuals move a small distance to an area similar to the one they left then this might be considered as being the same as no mobility. The economic and social environment of those that moved, and their propensity for obtaining employment may not have changed. If individuals leave to find jobs in better areas then we need to ask what it is about the low status *areas* where manufacturing employees used to live that leads to unemployment persistence.

It is unlikely that the unemployment increase since 1976 can be attributed to only one cause and be fully explained by a simple model. The facts however suggest that there are significant regional shocks *within* cities and these shocks may lead to unemployment persistence. If so then a new research agenda is needed. One which combines the textbook macro analysis of unemployment with regional specific shocks and persistence.



## V Some Policy Comments

### Education policy

Many countries, including Australia, have attempted to use an expansion of education and skill training to offset growing income inequality and unemployment among the low paid. Students have been offered means tested living allowances for high school and tertiary education and interest free loans to pay university fees. Tertiary and high school places have increased substantially. Indeed, over the last decade and a half, Australia has embarked upon one of the most ambitious education programs in the OECD.

This education expansion has had a large impact on the average neighbourhood from areas of median SES. Between 1976 and 1991 the proportion of the population with degrees increased from 3.7 to 14.7 per cent and the proportion of the population without qualifications fell from 66 to 45 per cent. And yet, despite this large increase in education of the potential workforce, male unemployment in median neighbourhoods has risen from 4.4 to 13.0 per cent. In addition, average income per adult has risen by less than one half a per cent per year.

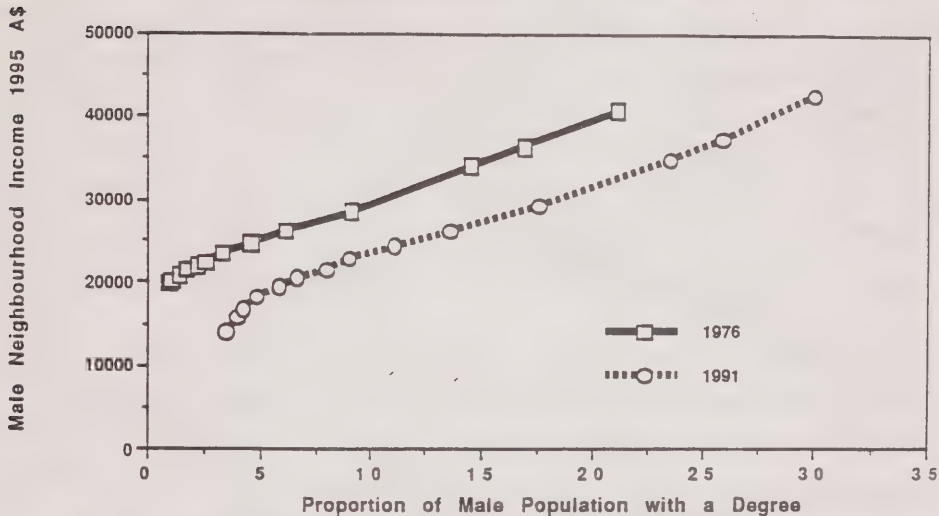
Income and employment outcomes may have been worse without education increases but it appears, nevertheless, that increased education levels have not been sufficient to offset significant employment losses or to generate significant income increases for the median neighbourhood. Education and skill training may primarily determine who gets jobs and may have very little influence on the number of jobs available or average rates of pay.

A similar sober assessment also appears inescapable from a comparison of the changing interrelationship between education levels and income inequality among neighbourhoods. The various measures of the education level and income level of a neighbourhood's residents are highly correlated and for our analysis we use the proportion of residents 15 years and over with a degree.<sup>(19)</sup>

In 1976, there was a strong positive association between the average education level of a neighbourhood and the income of its residents. On average, a one percentage point increase in numbers of men holding degrees was associated with additional neighbourhood income of \$1000 (Figure 12). For women, the relationship was \$500 for each additional percentage point increase in the

proportion of the female population with degrees (Figure 13). Among neighbourhoods, as among individuals, higher education brings higher income.

Figure 12 : Male Income and Proportion of Male Population with a Degree



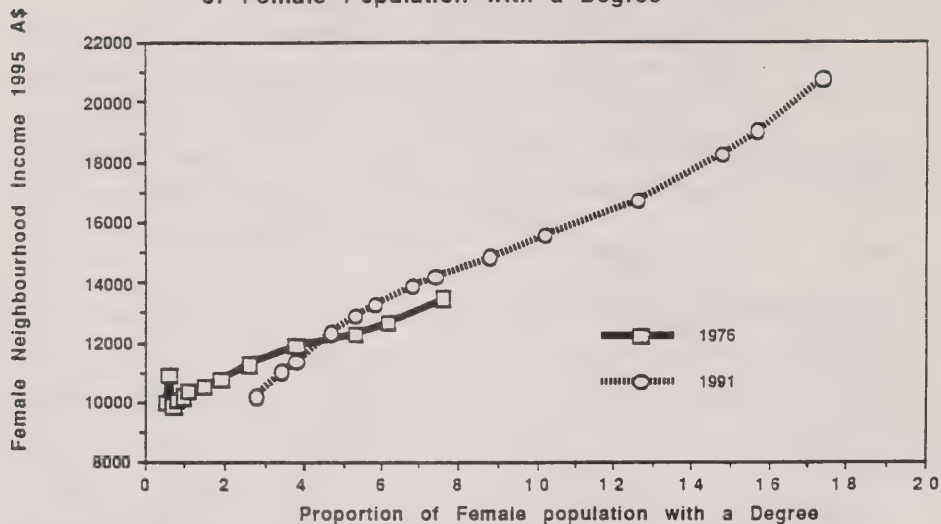
From left to right the points represent the male mean neighbourhood income and the proportion of the male population with a degree of the bottom 1% and 5% of Collector Districts, then Collector District Deciles, and finally the top 5% and 1% of Collector Districts.

It is noticeable, however, that in 1976 there is no systematic relationship between employment-population ratios and education for either men or women. More education is associated with more income but not because employment is increased. This is a restatement of the fact that in 1976 employment opportunities were distributed equally across neighbourhoods ranked by SES.

By 1991, the relationships have changed a great deal. For men, more education is still positively associated with more income but the relationship has shifted so that for *any* given proportion of the population with degrees the annual income level has fallen by about \$8000. If the employment-education relationship can be thought of as a causal one then to achieve the same level of male income as in 1976 a neighbourhood needs to achieve a higher education level. Consider a neighbourhood from a low SES area. To maintain male income this neighbourhood needed to increase the proportion of its male population with degrees by 6 percentage points between 1976 and 1991. The actual increase was 2.5 percentage points, hence the fall in male income. In high SES areas the increase

needed in the proportion with degrees was around 8 percentage points. The actual increase was 9 percentage points, hence the increase in male income.

Figure 13 : Female Income and Proportion of Female Population with a Degree



From left to right the points represent the female mean neighbourhood income and the proportion of the female population with a degree of the bottom 1% and 5% of Collector Districts, then Collector District Deciles, and finally the top 5% and 1% of Collector Districts.

This shift in the education-income relationship is very important. On the basis of the 1976 relationship between the incidence of degrees and the income of a neighbourhood, the increased education attainment of the average neighbourhood within the bottom five per cent of CDs should have brought about an income increase of \$3500. In fact, there has been a fall of \$6000. The \$9500 gap clearly illustrates the importance of the change.

The principal source of the shift in the male education-income relationship is a shift in the employment-education relationship. For neighbourhoods from the bottom 70 per cent of SES areas the education-employment relationship has moved down but, *in addition*, there is now a strong neighbourhood relationship between less neighbourhood education and less neighbourhood employment: a relationship that did not exist in 1976. The lower the male education level of a neighbourhood the lower the male employment-population ratio. Education not only affects income, as it always has, but now it also affects the employment-population ratio. Poor neighbourhoods are now twice disadvantaged by low education levels.

For neighbourhoods from the top 30 per cent of SES areas further education does not bring further employment. For these neighbourhoods nothing has changed with respect to *changes* in education and changes in employment. But the education-employment relationship has also shifted downward so at each neighbourhood education level there is 15 percentage points less employment.

Labour market changes for women are similar to those for men in all but one respect. That is the education-income relationship has changed little since 1976 except in areas of low SES where additional degrees among residents have not brought neighbourhood income increases. But, unlike the male relationship, the large increase in women's income across all but the low SES areas is associated with the large increase in education. There has been no systematic shift down in the employment-income curve as in the male labour market.

There is a clear dichotomy between neighbourhoods. For the top 30 per cent of SES areas income has fallen for each education level for men but increased for women. The relationship between *changes* in income and *changes* in education however has not shifted for this group.

For the remaining 70 per cent of neighbourhoods the lower the education level the greater the income fall. Employment and education are now associated and hence there is less income at each education level.

To conclude, we look at the change in the distribution of education levels across neighbourhoods to assess the general impact of the large increases in education levels of the potential workforce. In 1976, 10 per cent of all residents 15 years and over who resided in CDs from the top 5 per cent SES possessed degrees. Now the proportion is 20 per cent. In the lowest 5 per cent of CDs in the proportion of the population with degrees has increased from 0.5 per cent to 3 per cent. The *absolute* gap in the degree distribution between areas has widened and the increased incidence of degree qualifications has been disproportionately concentrated in CDs with high SES. Neighbourhoods have not become more equal. For every ten new degree holders in the top 5 per cent of CDs there has been an additional three in low SES areas. A similar pattern is evident if different measures of education are used.

Areas of low employment and low income have not been untouched by the expansion of education. Education levels have increased across all



neighbourhoods but two major problems have emerged. First, the increase in education in absolute terms has been greater in high SES areas so that inequality has increased. Second, the relationship between employment and education levels has shifted in low SES areas such that a given level of education now delivers much less income and the move to a more disadvantageous relationship has dominated the improvement in the education level.<sup>(20)</sup>

### Macro policy, wages and employment bias

We begin by stating the obvious. A necessary condition to reduce urban inequality to levels more closely approximating those of the mid-1970s is that macro policy must be directed towards strong employment growth. Furthermore, a rate of aggregate job creation that implies average unemployment rates above 6 per cent will not be sufficient. The change in urban inequality between 1976 and 1991 occurred in an environment where the unemployment rate averaged about 6.9 per cent.

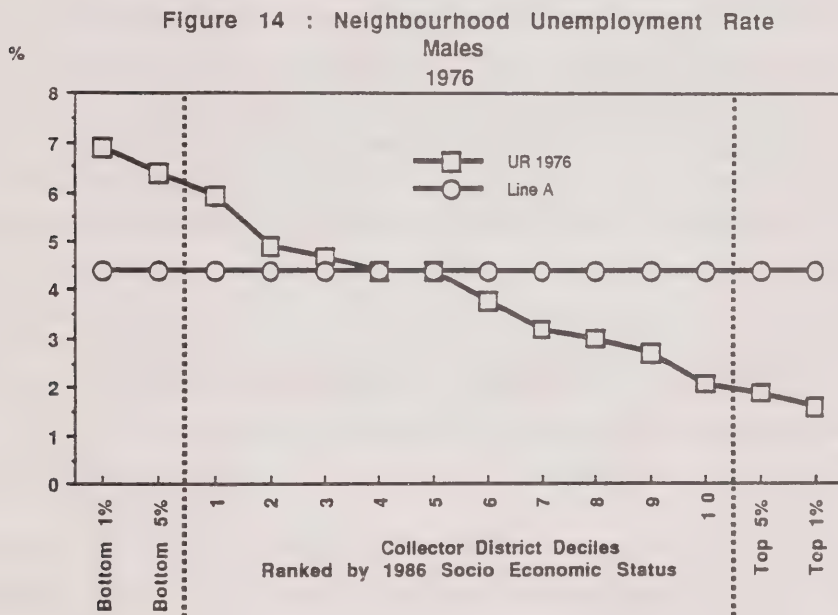
It is clear from the pattern of neighbourhood job loss presented in Figures 4 and 5 that if urban inequality is to be reduced there must be a substantial bias in new job growth towards those who live in depressed neighbourhoods. If we make the unlikely assumption that participation rates are fixed and we wish to return to the 1976 unemployment relationship then, for each additional job taken up in the top 5 per cent of SES areas, about 12 jobs are needed for those from the lowest 5 per cent of SES areas. It seems that macro policy alone will be unable to achieve this outcome.

First, even if the economy continues to create jobs at a fast rate, and for a sufficiently long time, the economy is unlikely to generate the neighbourhood job bias needed. Long run employment trends seem to be against the unskilled, the lowly educated and those who live in depressed neighbourhoods.

Second, it would also seem that the new pattern of unemployment across neighbourhoods will make it more difficult to pursue fast economic growth without the development of inflationary wage pressures. It might be expected that as the economy expands, inflationary wage pressures will be exerted by those in good neighbourhoods and the growth cycle will come to an end before new jobs extend to depressed neighbourhoods.



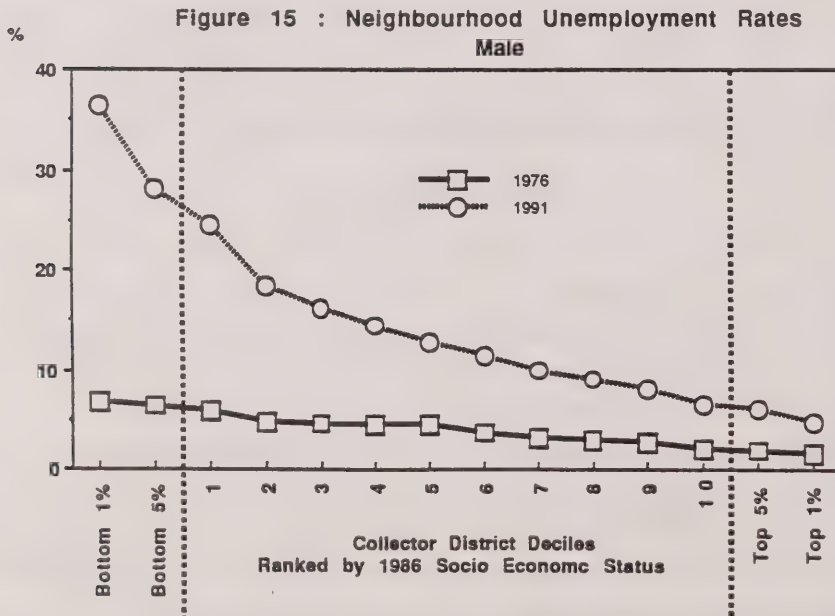
This problem can be analysed with the help of a simple diagram. Figure 14 presents the unemployment pattern across neighbourhoods in 1976. Unemployment is higher in areas of low SES but the 5 percentage point unemployment gap between neighbourhoods from the highest and lowest 5 per cent of neighbourhoods ranked by SES is small. Suppose now that the economy grows sufficiently fast to create enough employment in aggregate that the number of jobs offered to those who live in a neighbourhood from the median SES group just equals the number of unemployed there. Furthermore, assume that there is no bias in initial job offers so that they are spread equally across all neighbourhoods (Line A).



Under these circumstances those who live in neighbourhoods with income above the median will receive more job offers than there are unemployed people—the vertical distance between the two lines. This will generate two responses. One is that as job offers are unfilled they will move down the neighbourhood rankings and offers will spill over to those who live in poorer neighbourhoods. This is the 'trickle down' effect of economic growth which seemed to operate throughout the 1950s and 1960s. The other response is that there will be pressure for wage increases among those who live in good neighbourhoods and find that job offers are plentiful. These two effects are

obviously inter-connected. The greater the spillover effect to those in low SES areas the less the wage pressures created by any given level of job offers.

The wage pressure emanating from those who live in good neighbourhoods depends on the position and slope of the unemployment curve and Line A, the job offer curve. The slope of the unemployment curve provides a measure of the degree of substitutability of labour across areas. A flat unemployment curve suggests there has been substantial 'trickle down' of job offers. The higher the substitutability of labour the more similar should be the rate of unemployment across areas. If the unemployment curve rotates and becomes steeper so that unemployment increases in low SES areas and decreases in high SES areas, this will suggest that the substitutability of labour from different SES areas has decreased. Since 1976 the unemployment curve has moved in ways which suggest that job offer spillovers have become weaker and, as a result, it has become more difficult for macro-economic policy alone to achieve full employment without generating inflationary pressures (Figure 15). The difference in male unemployment rates from the bottom to the top 5 per cent of SES areas has increased from 5 percentage points in 1976 to 17.5 percentage points in 1991.



The slope of Line A measures the bias in the job offers across areas. If Line A is horizontal there is no neighbourhood bias. Over the last two decades it is probable that the slope of Line A has been positive and jobs have been disproportionately offered to inhabitants of high SES areas. These individuals are the better qualified and more skilled. As a result of this bias the wage pressure has been greater than if the job offer line was horizontal or negatively sloping. There are reasons to believe that over time the unemployment rate curve will become steeper and job offer spillovers may become weaker. Should this occur then macro policy would become less effective in its attempt to increase more jobs without inflation.

Macro policy needs to be accompanied by successful labour market interventionist policies to bring residents of depressed areas back into the labour market. If there is a widening of income inequality and job opportunities across urban areas then the internal dynamics of depressed areas may be increasingly creating islands which are largely outside the main trade routes of economic growth. Unemployed people in depressed neighbourhoods may be associating primarily with other unemployed people and as a result may not hear of available job opportunities. Most individuals find new jobs by being told of opportunities by friends or relatives.<sup>(21)</sup> It may also be that individuals living in depressed neighbourhoods develop behaviour patterns that make it difficult for them to be successful in job search.

### *Relative wages policy*

There are two obvious wage policy reactions that might be made to the above analysis. The first could be thought of as a macro response. If we could control wage increases for those who live in high SES neighbourhoods, so that their response to excess demand does not lead to an outbreak of wage inflation, the economic cycle may continue longer and there will be more job offer spillovers to those who live in low SES areas. This is essentially the policy that was followed by the Accord process throughout most of the 1980s and early 1990s.

The second reaction, which might be thought of as a micro response, is to attempt to flatten the unemployment rate curve and change the job offer curve by lowering wages of those who live in low employment neighbourhoods. This might be achieved by deregulating the labour market so that the wages and income of those who live in low SES areas will fall further but be offset to some degree by increased employment opportunities. The lower wages will either

create more low paid jobs and/or divert some wage offers away from higher priced labour.

It is not known how much wages might need to fall. To increase employment of the bottom 5 per cent of SES areas back to 1976 levels, relative to high SES areas, would require at least a 44 per cent increase in male employment and a 70 per cent increase in female employment. It appears likely therefore that a substantial wage fall would be required. This raises a number of problems. First, it takes time to create jobs so that the short run wage fall might be substantial. So substantial in fact that individuals may prefer not to work and be supported by unemployment benefits and other welfare payments and perhaps a range of black economy activities. If wage reductions were to occur and yet low employment rates persisted in low SES areas it might be expected that governments would eventually react and reduce labour market related benefit levels on the grounds that the increased benefit levels, relative to low wages, were discouraging individuals from accepting jobs.

Labour market related benefits are the main source of income for most individuals in low SES areas and any reduction must inevitably increase poverty and widen income distribution further. It is obvious why governments and communities are reluctant to go down the path of substantial reductions in wages and benefits and why it is often suggested that it might be better to try and increase the employability of individuals in low SES areas rather than reduce their potential wage. The main policy instruments to increase employability have been developed in the context of the *Working Nation* statement (Commonwealth of Australia 1994) and include wage subsidies for the long term unemployed and increased education and training for the low skilled. The neighbourhood analyses of this paper strengthens the support for these programs and we hope that subsequent evaluations of the Working Nation initiatives indicate that these programs are effective.



## VI Concluding Remarks

Since the early 1970s the Australian economy has had a major job creation problem. According to the Census the proportion of men aged 15 to 64 years employed in a median neighbourhood is 19 per cent less than in 1976. The proportion of women employed is 1 per cent more. The shortage of jobs has not been rationed evenly throughout our society. Job loss and income falls are concentrated in low SES neighbourhoods and job growth and income rises are concentrated in neighbourhoods of high SES.

Between 1976 and 1991, the lowest 1 per cent of neighbourhoods, based on a 1986 SES ranking, have lost 45 per cent of their employment, 23 per cent of their household income and male unemployment has increased from 6.4 to 28.1 per cent. The contrast with areas of high SES is marked: in the highest SES areas employment has fallen marginally, household income has increased by 31 per cent and male unemployment has increased—but only to 4.8 per cent. The proportion of women employed in high SES areas now exceeds by 20 per cent the proportion of men employed in low SES areas.

To lose employment and to suffer significant income losses are bad outcomes for anyone but does it matter that these undesirable outcomes increasingly possess a spatial component? It is sometimes suggested that it does not and that nothing is gained by knowing that it is people who live in poor neighbourhoods who are increasingly not at work, that part-time jobs are going to young people and women who live in high SES neighbourhoods and that income is rising in the best SES neighbourhoods but falling in poor neighbourhoods. Our intuition suggests that neighbourhoods do matter. It seems likely that the greater the economic polarisation within our cities the less equal are the opportunities for young people and the more likely that bad neighbourhood pathologies will emerge. But there is not widespread agreement on these matters among Australian researchers.

But what should be done? It is not easy to know. There has not been a strong Australian tradition of thinking about economic policy and neighbourhoods and it is not always easy to move from thought patterns that revolve around individuals or the macro economy to thought patterns that stress geography. There is also not widespread agreement as yet whether the growth of inequality across areas is just the natural outcome of more inequality among individuals,



the impact of concentration of those individuals within a location, or whether the nature of the geographical areas is contributing to the inequality growth.

There is always more to be done. We do not know enough about social and geographical mobility, the role of job finding networks and changing income and employment opportunities over the lifetimes of people who live in poor neighbourhoods. An attempt should also be made to take into account the delivery of non-cash services to areas of low SES. The next stage is to identify distressed areas and locations which have lost the greatest amount of income, describe more thoroughly their characteristics and assess whether there are efficient tools of government policy to address the locational aspects of joblessness.

## NOTES

- \* Professor R.G. Gregory is Professor of Economics and Head of the Economics Program, Research School of Social Sciences, Australian National University; Mr Boyd Hunter is Post-Doctoral Fellow, Centre for Aboriginal Economic Policy Research, Australian National University. Cathy Baird and Eva Klug provided invaluable assistance in preparing the paper. This research was funded in part by the Commonwealth through the former Department of Housing and Regional Development and continues now through the Department of Transport and Regional Development.
- 1 There is no consensus, however, as to the source of these large changes. They seem to be related to shifts in labour demand away from men and towards women workers and away from unskilled workers towards those with higher education levels. There are some areas of agreement among researchers as to what is *not* driving the increased inequality. It does *not* seem to be the case that inequality among individuals is being driven primarily by the decline in manufacturing, the growth of trade with Asia or immigrant flows of low skilled labour. We are more agnostic.
- 2 While there is a general consensus in this research that market incomes have become more unequal the situation with respect to other measures of income are less clear. Government intervention in Australia has a strong equalising component. Harding (1995) has estimated that the ratio of market incomes between the top and bottom 20 per cent of the Australian population is 12.5:1. This reduces to 4.9:1 once transfer payments are taken into account, 3.8:1 after income tax and 2.9:1 after government expenditure on services such as education and health.

3 These studies are reviewed in Maher (1995).

4 In this regard Maher, in summarising the body of work concluded

The outer suburbs in general, are no more or less disadvantaged than are a number of other settlement regions ... For the majority in the outer suburbs the lower level of proximity are compensated for by higher levels of mobility, as well as other sought after attributes such as space, newness, privacy and social compatibility. (Maher 1995)

The studies also tend to show that concentrations of disadvantage were distributed throughout the urban area, and not confined to any specific region.

5 We have not found any cross-country comparisons of urban neighbourhood inequality. Studies in other countries are not directly comparable with our work.

6 The poverty of the US ghettos is compounded by the concentration of disadvantaged Americans of African descent (see Wilson 1987). Another contributing factor is the US Federal system that places emphasis on local taxes as a revenue source. The Australian Federal system, in contrast, is a force for equalising income and government services across neighbourhoods.

7 Unemployment at August each Census year taken from the *Labour Force Survey*.

8 CDs were omitted from the panel if the total population was less than 50 to avoid the sampling error deliberately introduced by the Australian Bureau of Statistics (ABS) to protect the confidentiality of persons in the neighbourhood. In each successive Census new CDs are added and in some circumstances the boundaries of CDs are changed. Our sample is a fixed number of CDs with unchanging boundaries that are to be found in each Census plus a small number where the CD may have been divided into two. We begin with a list of CDs from the 1986 Census and if there was more than one CD that corresponded to the 1986 CD then the first was taken to be representative of the 1986 CD.

9 The data are released by ABS as group averages within each neighbourhood to protect the confidentiality of individual census returns. As an example of the difficulties of data that are released as group averages consider the following: data are available for mean income and mean employment within each CD but not mean income per employed person and there is no way that we can accurately calculate this figure.

10 We use the Urban and Rural Indexes of Relative Advantage. The Indexes are calculated by the application of Principal Components. The relevant variables include data such as family income greater than 50,000, the

proportion of CD residents with degrees, the occupational distribution of the employed workforce and the number of bedrooms per household.

- 11 A household consists of a person living alone, or two or more related or unrelated persons who live and eat together in private residential accommodation.
- 12 The Census income is income reported from all sources. It does not include services in kind. It is also not adjusted for taxes paid. Professor Harding and associates at the National Centre for Social and Economic Modelling has begun to measure the impact of taxation and government expenditure such as education, health and public housing on different income groups. This preliminary research indicates that government services in kind are very important to equalising the individual and household distribution of income. Expenditure on non-cash benefits is estimated to be of a similar magnitude to Federal Government expenditure on social security and welfare. These expenditures have not yet been analysed on an area basis and it is not clear that they can be. There has been no study of changes on non-cash benefits through time.
- 13 The data collection method for the Census is for household members to complete a questionnaire. Many other ABS data sources are collected by household interviews. There are systematic differences in data according to the collection method. The Census tends to understate income and employment of those whose involvement in the workforce is peripheral.
- 14 An investigation of the coefficient of variation of income within neighbourhoods suggests that within neighbourhoods income allocation across households and individuals is not becoming more homogeneous. This suggests that we are observing household income changes within neighbourhoods, ranked by SES, rather than a sorting phenomenon which is reallocating households across neighbourhoods.
- 15 These data are taken from the *Labour Force Survey* August 1976 and August 1991.
- 16 Consider a hypothetical and perhaps exaggerated example. If low skilled jobs are lost in Footscray, Victoria, and created in Dandenong (40 kilometres away) it seems very unlikely that a unemployed 50 year old man, who usually earns a low wage when employed, will begin to travel each day from one part of the city outskirts to another. The real income gaps between government income support and low rents, on the one hand, and low wages less travel expenses to the other part of the city, on the other, may result in the unemployed remaining without work where they are. Furthermore, if the person is a home owner and his house price falls in response to the regional shock, he is unlikely to sell and move.
- 17 The change in male employment between 1976 and 1991 can be explained in approximately equal proportions in terms of the 1976 socio-economic



status of the area and the 1976 proportion of males employed in manufacturing.

- 18 There is an important policy issue here that relates to the rental rebate policy in public housing. These and the impact of withdrawal rates of social security payments mean that a person living in public housing may see little benefit of any income from employment, especially if they incur transport and child care expenses.
- 19 Other possible variables include the proportion with a qualification and the average number of years of schooling. A degree is defined as Bachelor Degree, Post Graduate Diploma, Masters Degree and Doctoral Degree in 1976 and as Bachelor Degree, Graduate Diploma or any other Higher Degree in 1991.
- 20 The very large expansion of education must have affected the quality of education. This may well have locational aspects. There is evidence indicating high failure rates in areas of low SES.
- 21 In a recent UK study Gregg and Wadsworth (1994) show that the most successful method utilised by unemployed males to find a job is through friends and contacts. The utilisation rate of this method is not the highest but it has the highest success rate. Among males one third of jobs are found this way. Among women one quarter of jobs are found from this method. Montgomery (1991) estimates that 50 per cent of all workers currently employed in the US found their jobs through friends and relatives.

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**More Work for Some, Less Work for Others:  
Working Hours, Collective Bargaining and  
Government Policy in the United States, France and  
Germany**

Sam Rosenberg  
Roosevelt University

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More Work for Some, Less Work for Others: Working Hours,  
Collective Bargaining and Government Policy in the United  
States, France and Germany

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This paper is prepared for presentation at the "Conference on the  
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More Work for Some, Less Work for Others: Working Hours,  
Collective Bargaining and Government Policy in the United  
States, France and Germany

On May 1, 1886, 40,000 workers in Chicago struck for an eight-hour work day, a revolutionary concept for that time. They were not immediately successful, but eventually the eight-hour work day became the norm in the United States.

May Day commemorates the eight-hour movement. It is celebrated in most advanced industrialized countries. And in many of these societies questions of working time reduction are hotly debated. May Day is not officially, at least, celebrated in the United States. And questions of working time reduction have virtually, though not entirely, disappeared from the national political debate.<sup>1</sup>

The labor movement which has historically called for shortening working time to increase employment opportunities has, with rare exception, been relatively silent on this matter now. Government policymakers do not view currently, and have rarely viewed historically, the shortening of the standard working week to be an effective policy tool for lowering unemployment. In addition, for at least a decade and a half, the federal government has not considered unemployment to be a serious economic problem.

Nor is reducing the standard working week thought to be an effective quid pro quo for the introduction of more flexible working hours in general, and shift work in particular. Though some forms of working time flexibility benefit workers, for example those included under the rubric of "family friendly", employers are the driving force behind the push for more flexibility in scheduling daily and weekly working hours. And, at the same time that unions have felt compelled to concede this extended freedom to management, they have often been forced to agree to working more hours for the same pay or the same number of hours but more inconveniently scheduled for the same pay.

In addition, increasing opportunities for shift work so as to lengthen the weekly duration of utilization of equipment is not part of a national discussion on working time. To the extent that weekly operating hours are at issue, the national discussion, muted at best, revolves around abandoning the 40-hour work week as the basis for overtime. Rather it would be replaced with a 160-hour basic work requirement over a 4-week period.

Unlike in the United States, shorter working hours have been at the center of the societal debates over working time in many European countries, including France and Germany. In both France and Germany, the full-time work week and work year was shortened in the 1980s. In France, the government legislated shorter working hours while in Germany the unions succeeded in gaining reduced full-time work weeks through collective negotiations with employers. Shorter working hours were seen as beneficial in and of themselves as well as critical for job creation.

Furthermore, in both societies questions of working time

flexibility have been strongly debated. They include work scheduling, shift work, part-time work and temporary work. In Germany, a reduction of working hours has been traded for more flexible working hours. The situation in France has been different. Here, the reduction of working time was superceded by an emphasis on the flexibility of working time.

However, within the past year or so, the tenor of discussions seems to be changing. At both the French governmental level and in negotiations between employers and unions, a cut in working hours as a means for job creation has returned to the fore. In Germany, on the other hand, the movement seems to be in the opposite direction. The push for shorter working hours appears to be postponed.

This paper will be divided into four main sections. The first provides an overview of the issues involved in the European debates on the reduction and reorganization of working time. Working hours are regulated both institutionally, by collective bargaining, and legally with the relative importance of each factor varying by society. The second section will analyze how working time arrangements in the United States, Germany and France have been influenced by collective bargaining in the 1980s and 1990s. While working time is minimally regulated legally in the United States, this is not the case in France and Germany. And in these societies there were significant changes in the legal framework regarding working time during the past fifteen years. The third section will investigate how government policy influenced the duration and flexibility of working time in these three countries, in general, and the nature of collective bargaining over working time in particular. Some conclusions are drawn in the fourth section.

#### THE EUROPEAN WORKING TIME DEBATE

The European working time debate focuses on two issues, conceptually separable but operationally intertwined. The first is working time reduction. The second is working time flexibility.

Working time reduction refers to shortening weekly, annual and lifetime working hours. Doing so may entail reducing the length of the standard full-time working week, increasing paid vacation time, and facilitating early retirement. Reducing working time, or "work-sharing", was advanced as a policy to fight unemployment.

"Jobless growth" in the 1970s and early 1980s was part of the impetus behind the call for "work-sharing". From 1973 to 1983, the beginning of the recovery from the serious recession of the 1980s, at least in the United States, the real GNP of European members of the OECD grew by almost as much as in the United States—18 per cent as compared with 22 per cent. Yet net employment rose by nearly 16 million in the United States whereas there was no net increase in employment in OECD Europe (OECD, 1986, pp. 7-8). Thus, given that work was scarce, the work should be shared more equitably among members of society.



West German (at the time) trade unionists and many unionists throughout Europe pushed for reducing the standard working week. The West German example provides an economic rationale for this program. From the mid-1960s to the early 1980s, labor productivity had grown faster than total output (Bosch and Sengenberger, 1989, p. 95). Thus, total annual working hours were declining. In the 1960s, the primary way this was manifested was through a decline in the standard work week. In the 1970s, there was an increase in vacation days. However, while working hours were declining, so was total employment. For example, with 1973 as the base year, an employment index for West Germany stood at 93.9 in 1985.

The performance of the German economy allowed further reductions in working time. Real wages had been increasing at a slower rate than productivity. Assuming fixed factor shares, if real wages are growing slower than labor productivity, there is room for prices to fall. If prices do not fall, then there is room for a reduction in weekly or annual working hours with no necessary reduction in weekly or annual pay. And if that were to occur and national output were to remain constant, then more jobs would be created and unemployment would be reduced. Lying behind this approach to unemployment reduction is the notion of worker solidarity, a solidarity between those with jobs and those without jobs. While the employed would receive rising real wages, in essence long-term wage restraint would be the quid pro quo for working time reduction.

But German employers, as well as employers in other European countries, did not see it the same way. Both in response to the push for a shorter working week and as an end in itself, European employers called for more flexibility in the utilization of labor time. Their demands included increasing numerical flexibility and increasing working time flexibility.

Increasing numerical flexibility means expanding the freedom of employers to vary the amounts of hours of work and the size of the work force in response to cyclical or structural variations in demand and/or technological change. As restrictions, or rigidities, on dismissals, fixed-term contracts, temporary work, and part-time work are weakened, numerical flexibility is enhanced.

European employment protection rules have been at the center of the debate over numerical flexibility. Increased numerical flexibility is seen as a way to lower labor costs and thus foster employment growth. Employment protection rules, on the other hand, increase the cost of dismissals by making them more difficult and/or requiring compensation for dismissals.

With high aggregate employment levels initially and a mild business cycle, job security legislation may be advantageous. Given high labor turnover costs, employers may be induced to vary the number of working hours per employee rather than varying the number of employees in the face of macroeconomic disturbances. Thus, the burden of adjustment would be shared relatively evenly among workers over the course of a business cycle.

However, this was not said to be the European story. Rather

Europe was in a deep recession. Thus, high unemployment rather than high employment was stabilized. Given the extreme uncertainty in Europe in recent years, the difficulties and costs of dismissal limited the hiring of new workers as needed because employers feared they would not be able to fire them easily if conditions worsened (Lindbeck, 1994). Thus, the burden of the crisis was concentrated on those individuals, often the long-term unemployed, who were unable to find work.

Eliminating or weakening such rules, for example, those requiring dismissal pay, would lower overall labor costs. This should encourage the substitution of labor for capital leading to additional employment. Similarly, easing the process for dismissals should make employers more willing to add to their labor forces, at least during periods of economic growth.<sup>2</sup>

In addition to regulating dismissals, European countries regulate the use of temporary work and fixed-term contracts. A further means of fostering numerical flexibility would be to allow a greater use of part-time and temporary workers. Such a policy may foster employment growth by lowering the effective cost of labor since part-time and temporary workers are often paid less than more permanent full-time workers and receive fewer social benefits and social protection.

Working time flexibility concerns the adjustment of working time to fluctuations of (daily, weekly or seasonal) orders and to the extension of plant operating time or shop opening hours. It covers a variety of elements including laws and collective agreement fixing hours of work, overtime, nightwork, weekend work and shiftwork. Increasing working time flexibility from the employer's perspective may mean increased amounts of night and weekend work, or an increased variability of working hours allowing, for example, the transformation of paid overtime into normal working hours without overtime premiums. Increased numerical flexibility, particularly a growing use of part-time and temporary workers, may foster working time flexibility as part-time employees work the non-standard shifts or temporary workers are hired and fired in response to fluctuating orders. To a degree, working time flexibility is a substitute for either the flexibility of labor costs or the lowering of labor costs. And to the extent that labor costs decline or function more like variable costs, employers may be more willing to increase their utilization of labor.

In addition to wanting to replace more expensive forms of working time organization with cheaper forms and improve the adjustment of working time and operating hours to fluctuations in orders, employers also wish to make better use of their existing capital equipment. If operating hours are extended, firms can reduce unit capital costs and thereby total unit costs of production. This has become more imperative as capital intensity is increasing and technological change is accelerating. Furthermore, with longer operating hours the risks associated with large-scale investments are reduced. However, longer operating hours may serve as a substitute for increased



investment in plant and equipment.

Operating hours can be extended by hiring additional shifts of full-time employees. But employers now want to extend the range of options available to them. They want to be able to extend operating hours in more finely measured quantities than hiring an additional full-time shift would imply. Thus, they seek out possibilities for new, alternative shift arrangements.

To the extent that capital operating time is increased and unit costs of production decline, output prices can decline leading to increased sales and higher levels of employment. In addition, the possibility exists for compensating employees with reduced working hours at no or minimal loss in pay as a result of an increase in capital operating hours.<sup>3</sup>

There is an ongoing debate in Europe over working time issues. And, not surprisingly, arguments have been advanced against the purported benefits of either working time reduction or working time flexibility, in its various manifestations. A conventional response to the relatively unconventional policy of reducing the standard working week is that such a policy may backfire. Jobs may be lost rather than gained. There are several ways this might occur:

(1) Wage rates per unit of time may increase as workers try to protect their real income.

(2) Even with fixed wage rates, wage costs per unit of time may rise given the existence of fixed costs per worker.

(3) With any fixed costs per worker, there is a stronger incentive to utilize overtime rather than hire additional workers.

(4) The rate of utilization of capital may decline if capital operating time decreases in line with the fall in standard working hours (Calmfors and Hoel, 1989).

While reducing the standard full-time work week may have its shortcomings, increasing numerical flexibility is also open to question. Regulations which directly or indirectly increase the costs of firing introduce a fundamental fairness into labor relations and provide workers with a sense of security against the loss of their livelihood. Such regulations are necessary given the power asymmetry between workers and employers. Workers have far fewer alternatives in the labor market than do employers (Buechtemann, 1993).

In addition, dismissal protection may have positive impacts on the behavior of workers and firms. Greater job security may increase labor productivity and lower unit labor costs if workers are more willing to accept technological change and greater flexibility of job assignments within the firm. In addition, a more stable workforce may encourage employers to invest in training, thereby upgrading the productivity of the existing workforce. In addition, workers may be more committed and loyal to employers they believe to be committed to their longevity within the firm (Emerson, 1988; Boyer, 1993; Abraham and Houseman, 1993).

Thus, increased unemployment may not arise from employment

protection rules. Furthermore, for there to be increased unemployment the negative impact of these rules on the outflow from unemployment to employment would have to exceed their positive effect on the outflow from employment to unemployment. This is not necessarily the case.

In addition to job security regulations, numerical flexibility deals with temporary and fixed-term contracts. While the advocates of increased labor market flexibility, conventionally defined, argue that allowing employers to utilize more temporary workers will increase aggregate employment, this is not necessarily the case. Rather, all that may occur is that there will be a larger cyclical response of employment during expansions and contractions. And if the employment adjustment is greater when firms are in recession than in expansion, overall employment may be negatively affected (Bentolilla and Saint-Paul, 1992).

Furthermore, the overall impact of more numerical flexibility on employment will also depend on whether part-time and temporary workers are substituted for full-time, more long-term employees. To the extent that such a substitution is occurring the addition to total employment arising from a growing number of part-time and temporary workers will be limited.

Increased numerical flexibility through deregulation raises the specter of widening inequality along a variety of dimensions including wage payments, working hours, job security and social benefits. Core and periphery work forces may emerge with core workers being more essential to the firm and thereby paid more and peripheral workers, serving as buffers, being paid substantially less. Wage and income inequality may come to be based heavily on hours worked and job stability, just those factors distinguishing core and peripheral workers (Harrison, 1994). Also, workers often need to work a specified continuous length of time with a single employer before qualifying for various forms of employment protections and a variety of social benefits. Not surprisingly, temporary workers are less likely to gain the requisite work experience. With part-time workers, the problem is somewhat different. For them, the crucial issues are generally the weekly hours of work and weekly or monthly pay. Part-time workers are less likely to be covered by a social security system than are full-time workers (Rosenberg, 1989).

The growth of core and peripheral work forces may lead to a reshuffling of the boundaries of labor market segmentation and perhaps even a hardening of the lines of segmentation. Temporary work may be linked with continuous employment instability rather than be one step along the road to more permanent employment. There may be minimal switching from part-time to full-time employment rather than part-time work leading to improved access to full-time work.

Part-time and temporary work, while part of the discussions surrounding numerical flexibility are also part of the debate over flexibility of working time. And here, too, there is a specter of increased inequality developing as a result of more

flexible working hours. Differences may emerge between the more labor intensive and the more capital intensive sectors of the economy. In the more capital intensive industries, employers are able to offer attractive compromises to their workers for being able to extend capital operating hours. This is not likely to be the case in the more labor intensive operations. Here new working time arrangements are introduced mainly to lower labor costs. And in these firms work forces are mainly non-union women part-time workers. In these circumstances, flexible working time arrangements are often associated with unattractive time schedules (Bosch, Dawkins and Michon, 1994; Bosch, 1995).

There is a more basic concern with flexible working hours that relates to the tension between work, family and leisure. In essence, "the aim of employers' interests in flexible working hours is to make labor power as available as electricity by a switch or water from a tap" (Hinrichs, 1991, p. 40). Or to use an overused metaphor "just in time" production will beget "just in time" labor. To the extent that this occurs, workers may have to struggle to align the factory clock with the cycles of their personal lives. Where workers can not control when they do and do not work, even shorter working hours as compensation for working time flexibility may not represent an improvement in their quality of life.

#### WORKING HOURS, WORK SCHEDULING AND THE INDUSTRIAL RELATIONS SYSTEM

The industrial relations system is crucial in the determination of working time. Across countries, industrial relations systems differ in the existence or absence of mechanisms to generalize norms for working time. Such a mechanism might be a law or trend-setting collective agreement, one which is either compulsorily or voluntarily applied to employers who were not signatories to the agreement. The industrial relations system in the United States is decentralized with a relative absence of generalized norms for working time. Germany and France are examples of more centralized industrial relations systems. In Germany, trend setting collective agreements create general norms for working time. In France, the government plays a more leading role in setting the overall context in which collective agreements on working time are negotiated and thereby in generating broad norms for working time.

##### United States

There are minimal federal governmental regulations of working time of those 16 years of age and older. The existing laws do not specify the number of hours to be worked daily, weekly, or annually, the hours in the day when work can occur, the number of days per week to be worked, the specific days on which work can occur, or the amount of vacation time that must be provided to workers. Rather they only require that a premium be paid for hours worked in excess of the stated amounts.

The major piece of federal legislation regulating working



time is the Fair Labor Standards Act of 1938. As of 1940, its overtime provision stated that covered employees, mainly non-supervisory personnel in the private sector, be paid a minimum of one and a half times the regular hourly rate for all hours worked after 40 hours per week.

Since governmental regulations minimally influence working time patterns, the industrial relations system is the primary arena wherein working hours are determined. In nonunion settings, the terms and conditions of employment are determined largely by management decision. The only constraint on management's free hand is the need to create a pay and hours package enabling it to attract the requisite workers. In unionized settings, pay and working time are regulated through collective bargaining arrangements.

The bargaining which does occur is highly decentralized. First, there are over 150,000 different labor contracts in force in the public and private sectors combined (Flanagan, Kahn, Smith and Ehrenberg, 1989, p. 400). Second, labor unions are quite numerous. There are approximately 200 national and international (having members in Canada and the United States) labor unions and 30 major professional and state employee associations, which although not labor unions per se function in a manner similar to unions (Mills, 1989, p. 61). Third, most collective bargaining contracts are signed between a company and a union or between a plant and a union. Fourth, union density is quite low. In 1994, union members, defined as employees belonging to traditional labor unions or to employee associations similar to labor unions, accounted for 15.5% of employed wage and salary workers. Union members made up 10.9% of employment in the private sector and 38.7% of employment in the public sector (U.S. Department of Labor, Bureau of Labor Statistics, February 8, 1995). Given the decentralized system of bargaining and the minimal legal regulation of working time, the debate on working time is not very intense.

In the early 1980s, the rate of unemployment rose to close to 10 per cent, a level not experienced since the Great Depression.<sup>4</sup> Nevertheless, unlike in earlier times, a movement to reduce working time in order to lower unemployment did not emerge. Rather, many employers responded to the more difficult economic environment by lengthening weekly or annual working time without necessarily increasing pay accordingly, pushing for more flexibility in scheduling work, and replacing full-time, full-year long-term workers by part-time, part-year contingent workers. Reducing labor costs was a primary goal. And the labor movement did not respond in a systematic way with an alternative approach to working time.

Data for the 1980s demonstrate a lengthening of working time. Weekly and annual working time of full-time workers increased in the 1980s. The average full-time work week declined from 43.4 hours in 1968 to 42.7 hours in 1979. The trend was reversed in the 1980s. The work week of the average full-time worker was 43.7 hours in 1989, 1 hour longer than in 1979. As

with the length of the full-time work week, overtime hours did increase in the 1980s, from the level at the end of the 1970s. Average weekly overtime hours of production workers in manufacturing were 3.6 in 1968, 3.8 in 1973, 3.3 in 1979 and 3.8 in 1989.

Furthermore, the proportion of all employed workers working 49 hours per week or more rose in the 1980s. In 1989, 19.4% of all workers were doing so. This is in contrast to 18.3% in 1968, 17.1% in 1973, and 16.5% in 1979. Executives, administrators, managers, sales workers and professionals are most likely to work such long hours (Rosenberg, 1991).

Not only did the length of the average work week increase in the 1980s, workers also received less time off for vacations and holidays. Paid days off for manufacturing workers rose from 17.9 days in 1967 to 23.1 days in 1979. However, the trend was reversed in the 1980s. In 1988, workers in manufacturing received only 21.8 days off with pay, 1.1 fewer days than in 1979. The days off with pay for all nonfarm business workers also fell in the 1980s, from 19.8 in 1981 to 17.9 in 1988 (Mishel and Frankel, 1991, p. 89-91).

The labor movement had historically emphasized the shortening of working time as a means of job creation. In the post World War II era, resolutions favoring shorter hours had been passed at almost every AFL-CIO convention (Cornfield, 1987).

And during the 1960s and 1970s, unions successfully negotiated for working time reductions, without any loss in pay, on a weekly or annual basis. For example, in 1963, the United Steelworkers (USWA) negotiated an agreement with the steel companies providing for 13 weeks of paid vacations every 5 years to the senior half of the workforce (the one-half of employees with the longest continuous service). Eventually 3 weeks, in addition to regular vacation, every 5 years was negotiated for the junior half of the work force.

The 1974-75 recession was severe and the unemployment rate rose above 8 per cent. The AFL-CIO and many unions called for reduced working time to put people back to work. The goal of the AFL-CIO was a 35-hour work week. The labor movement formed the All Unions Committee to Shorten the Work Week and strongly supported an amendment to the FLSA-H.R. 1784-calling for an increase in the overtime premium from time and a half to double time, for the premium to become effective after 35 hours a week instead of 40 hours, and for employers to cease mandatory overtime. The bill was not passed. (The Johnson administration had, more than a decade earlier, introduced legislation increasing the penalty for overtime work. It, too, did not pass.)

Furthermore, while working time reduction was a subject of collective bargaining negotiations during 1975-76, a general reduction in weekly working time did not occur. A coalition of unions headed by the United Electrical Workers were not able to gain a 32-hour work week without a reduction in pay from General Electric and Westinghouse. On the other hand, workers at Ford



Motor Company won twelve paid personal holidays over the life of the three year contract, in addition to regular holiday, vacation and sick days (Levitan and Belous, 1977).

The recession of the early 1980s was more severe than that of 1974-75. Yet, there was virtually no discussion of work time reduction as a means for job creation. Rather, collective bargaining settlements mirrored the overall trends in working time discussed above.

Many of the unions which had earlier emphasized the shortening of working time as a means of job creation granted concessions in the area of paid time off. Ironically, unions justified the lessening of paid time off as a means for preserving jobs.

In 1983, in negotiations with the major steel producers, the United Steelworkers was forced to give up the extended vacation plan, vacation bonuses, and one paid holiday. In 1982, the United Auto Workers (UAW) agreed to give up the equivalent of approximately two weeks of paid time off annually for workers in the auto industry. Paid holidays and paid vacation time were also reduced in other sectors including the rubber industry and retail food stores. Some rest periods were eliminated in meatpacking, auto and steel industries.

During the 1980s, the Airline Pilots Association provided many airline companies with a variety of working time concessions increasing the proportion of flight time to paid hours. Previously, companies were considered to be doing well if pilots flew at 60 per cent of their credited hours. The concessions resulted in pilots flying between 90-100 per cent of their maximum hours (Capelli, 1987, pp. 162-163).

Similar changes occurred in the trucking industry. In 1982, the national agreement was changed so that truckers were paid only for actual time spent driving. Previously, they were paid for a specified number of hours per trip. Often these specified times were based on the time the trip took many years ago (Business Week, 1983).

Not only was paid time off given up in many sectors, but absences also declined especially in goods-producing industries (Klein, 1986). Many companies, including the members of the Bituminous Coal Operators Association implemented stricter absenteeism policies.

The length of working time was not the only matter focused on by labor and management. The daily and weekly scheduling of working time was also in dispute. For management, the issue was scheduling flexibility. For workers, the result was often a decline in overtime pay and /or the elimination of premium pay for Saturday and Sunday work, and more inconvenient work schedules. Overall, the incidence of shift working increased. In 1985, 15.9% of all full-time employees were shift workers. That figure rose to 17.8% in 1991 (Mellor, 1986; ).

The tire industry provides a particularly useful example of changing management practices regarding work scheduling. During the 1930s, a 6-hour a day and 6-day a week work schedule was

standard practice. By the end of the 1970s, this work schedule was virtually gone. Since 1979, local negotiations throughout the industry have resulted in a shift to a 7-day continuous operation work schedule. The workweek is often 40 hours and premium pay for weekend work, if part of the regular 40-hour workweek, has been largely eliminated (Jeszeck, 1986). In the early 1980s, premium pay for weekend work was also cut in other industries such as aluminum, retail food stores, steel, trucking and textiles.

An economic expansion began in 1983, lasting until the end of the decade. But companies were still interested in lengthening working time and gaining increased scheduling flexibility. For example, in 1988 International Paper which ran a continuous operation, 24-hours a day for 362 days a year, was able to force its workers to give up their 3 holidays at Christmas and their time-and-a half pay for working on Sundays. In 1990, paper mill workers at Georgia-Pacific gave up their double-time for Sunday work though the company did agree to ease mandatory work on holidays (including the Christmas season).

In 1990, flexible work scheduling was one of the issues in dispute in the 10 month strike by the United Mine Workers against the Pittston Coal Group. As part of the settlement, the company won the right to operate around the clock--except for the first shift on Sunday, Christmas Eve, and Christmas Day. Furthermore, the firm gained flexibility in scheduling work. It now had three options: to run a conventional 8-hour, 5-day shift; to run a 10-hour, 4-day shift; or to run 28-day rotating shifts (Kwik, 1990).

In addition to pushing for longer and more flexible hours from their full-time workers, American companies responded to the more difficult economic environment by striving to create a just-in-time, cheaper labor force. The usage of part-time and temporary workers increased. Between 1976 and 1990, the number of part-timers increased by 7% compared to a 2% growth of full-time workers (Harrison, 1994, p. 202). By 1990, the proportion of employed persons working part-time was approximately 19%. While part-time jobs are not necessarily bad, expanding part-time employment was concentrated in "bad" secondary part-time jobs (Tilly, 1992).

Temporary jobs are also growing in importance. Between 1982 and 1990, temporary employment grew 3 times faster than employment as a whole (Harrison, 1994, p. 202). However, temporary jobs are still a small share of total employment.

The increase in part-time and temporary employment mainly reflects employer, not employee, decision and, at least regarding temporary employment has been facilitated by the decline of relative union bargaining power (Tilly, 1992; Carre, 1992; Golden and Applebaum, 1990). And the growth in part-time employees is mainly accounted for by a rise in the percentage of employees who work part-time but would prefer full-time employment (Ichniowski and Preston, 1986; Ehrenberg, Rosenberg and Li, 1988; Tilly, 1992). In the 1980s, the role of part-timers was a central issue in collective bargaining in, for example, trucking, airlines and



the U.S. postal service.

The length of the work week and work scheduling has continued to be strongly bargained over in the 1990s. Employers have not been as successful in gaining their demands as they were during the 1980s. Worker militancy around the issues of work length and work schedules seems to be growing.

The work week of the average full-time wage and salary worker was 43.0 hours in 1995, lower than in 1989. The proportion of all employed workers working 49 hours a week or more equalled 19.5%, slightly more than in 1989. And paid overtime hours increased sharply in the 1990s. In 1994, average weekly overtime hours of production workers in manufacturing was 4.7 and in 1995 it equalled 4.4. In 1995, workers in durable goods industries were averaging 5.7 hours of paid overtime per week (Employment and Earnings, 1996, pp. 188, 189, 221).

There have been several well-publicized working time disputes at major companies such as General Motors, Bridgestone/Firestone Tire, Caterpillar and A.E. Staley. At General Motors, the issue was lengthy overtime. At the Buick City plant in Flint, Michigan, some workers had been working 6 days a week and up to 12 hours per day. The company had not hired any long-term hourly workers since 1986. On September 27, 1994, the workers went on strike. They wanted forced overtime reduced and permanent hires. As part of the settlement, the company agreed to hire more than 500 new long-term employees and to stop using nonunion temporary workers.

Several years earlier, the issue at General Motors was 3-shift production. In the 1990 negotiation with the UAW, General Motors (GM) was interested in having the union accept 3-shift production plans at U.S. factories. Given the excess capacity in the auto industry at the time, the UAW feared that 3-shift production throughout the company would allow GM to shut more U.S. plants. It successfully resisted this demand at the national level.

Negotiations over 3-shift production have occurred at the local level. In 1990 Chrysler workers at a highly profitable mini-van plant in St. Louis, Missouri did agree to 3-shift production. In return, they received a shorter workweek with no loss of weekly pay. Two shifts had been working 54 hours per week. To minimize cost, the company wished to reorganize these 2 shifts into 3 crews, each working 4 10-hour days with no overtime pay. The workers, instead, pushed for a third shift to be hired. An agreement was reached whereby each shift would work 7 hours a day Monday-Friday and 9 hours on 2 out of 3 Saturdays. The workers would receive 40 hours pay for their 35 hours on Monday-Friday and time-and-a half for work on Saturday (Slaughter, 1990).

In addition, GM workers at the Lordstown, Ohio plant agreed to 3-shift production, with each shift working 4 10-hour days per week. To gain this change in work scheduling, the company was forced to agree to provide work at the Lordstown plant for all the workers employed at an adjacent GM auto plant that was

scheduled to close.

Workers at other companies have been less successful. New shift systems have often been at the heart of the disputes. Four years ago A.E. Staley Manufacturing Co., a corn miller in Decatur, Illinois imposed 12 hour shifts for 3 days, with 2 days off. Every 30 days day and night shift workers would exchange shifts. Management retained the right to require mandatory overtime of up to 4 hours more per day. A 30 month strike ensued. Eventually, the workers were forced to acquiesce.

Decatur, Illinois is known by some workers as "The War Zone". Two other companies in the area have also experienced strikes over work schedules. At Bridgestone/Firestone Tires, workers, after a 10-month strike, were also forced to accept 12 hour shifts and 7 day a week around the clock production schedules. At the same time, they also saw their hourly pay slashed.

Caterpillar also has a plant in the Decatur area. After a long dispute, UAW workers were forced to provide management with more flexibility to implement alternative work schedules. This would mean 12-hour shifts that would be "voluntary if possible".

In the quest for efficiency by factory management, the 8-hour day, 5-day work week is slowly disappearing. Full-time, long-term jobs are also becoming increasingly vulnerable. Saving full-time, long-term jobs is also one of the goals of many unions. In the Caterpillar dispute, the company also won the right to hire more part-time, temporary workers who would be paid at a lower new-hire wage rate.

The use of part-timers and casual workers was also at issue in the national trucking strike by the Teamsters in 1994. Employers wanted to replace many full-time workers on the loading dock with part-timers, earning about half the union rate. The companies eventually backed down, to a large degree, on the part-time question. In another dispute in 1994, the Teamsters were able to force Airborne Freight to replace some part-time employees with full-timers (Moody and Sagovac, 1995). Part-time and temporary workers continue to be controversial in the U.S. Post Office and airlines, among other industries.

In general, toward the end of the 1980s, and into the 1990s, workers were able to gain back some of the concessions they had earlier made regarding the length of working time. And some workers who had not made concessions in the 1980s have recently been able to win improved holiday and vacation provisions in their contracts.

#### Germany

While in the United States, the relative weakness of unions has led to longer, more flexible working hours, in Germany unions were able to gain shorter working hours, albeit at the cost of more flexible hours. At the same time, the wage demands of German unions have been moderate.

The industrial relations system in Germany is characterized by an indirect mode of coordination. Most collective agreements

are negotiated regionally by sector. With some exceptions (such as Volkswagen), company level bargaining mainly occurs with small firms. The company level agreements generally resemble the sectoral agreements. German businesses are organized into sectoral business associations. Ninety per cent of German workers are covered by collective agreements even though only one-third are members of 1 of 16 German unions. Though there are 16 unions, the IG Metall, the metal and engineering workers union, is by far the largest union. The agreements that it signs generally serve as models for bargaining in other industries (Thelen, 1991; OECD, 1994).

In 1975, the German employers associations vowed not to agree to reduce the 40-hour work week or increase the 30 day vacation period. And in 1978-79, IG-Metall, the metal and engineering workers union, failed to gain a 35-hour week.

However, IG-Metall continued to be interested in working time reduction, as a means for work sharing, as were other German unions. This issue dominated collective negotiations, once again, in 1984. Long strikes were fought over this issue. Eventually IG-Metall and IG Druck und Papier (representing printers and paper workers) forced employers to given in on the matter of work week reductions. At the same time, however, the employers forced the unions to allow them more freedom in scheduling weekly working hours.

More specifically, the agreements called for the following:

(1) The work week would be reduced to 38.5 hours with full wage compensation.

(2) Based on the needs of the enterprise, individual working time per week could vary between 37 and 40 hours. Average working hours per enterprise could not exceed 38.5 hours.

(3) However, this upper limit on average working hours could be broken in any week, as long as the weekly average over a two month period did not exceed 38.5 hours. Weekly hours of work could be spread evenly or unevenly over the 5 working days in the week.

(4) Management and the workers council would decide how to implement the contract at the enterprise level.

Working time was further reduced in the 1987 negotiations in the metalworking and printing industries and working time was made even more flexible. The work week was to be reduced in two stages to 37 hours with full wage compensation. Individual work hours could vary between 36.5 and 39 hours. Now, the weekly average working time could not exceed 37 hours, calculated over a 6 month period.

Further work week reductions were gained in 1990. The work week was to be reduced to 36 hours in 1993 and 35 hours in 1995. Until 1994, the constraint on average annual hours continued to be calculated over a 6 month period. In 1994, the period was extended to 12 months. Working time was to be further differentiated within the plant. Thirteen per cent of a plant's employees were able to voluntarily choose to work up to 40 hours per week, compensated by straight time pay or a sabbatical taken



within the following 2 years. Others would not be obliged to work fewer hours to counterbalance their work hours. Employers were able to bargain directly with individual workers on this issue.

Reductions in working time have also taken place outside of the printing and metalworking industries. By December, 1989, 89 per cent of all employees covered by collective agreements had a working week less than 40 hours. The average contractual working week was 38.5 hours. In many cases unions were forced to trade more flexibility in working hours for worktime reduction. Longer periods of variation in the workweek were provided. Restrictions were relaxed on evening and Saturday work. New shift schedules were introduced (Bosch and Sengenberger, 1989; Bosch, 1990; Bosch, 1993).

The average contractual working week fell further in the 1990s. In 1994, in the former West Germany, the average contractual working week stood at 37.75 hours (Bosch, 1995). A quarter of the work force has a normal working week of 35 hours. And agreements have been reached in sectors outside of steel and printing, where the 35 hour work week is to be achieved in the near future.

Even though the length of the agreed upon full-time work week is declining, paid overtime is not increasing. In fact, since 1984 there has been a slight decline in paid overtime. In 1995, weekly paid overtime hours per total civilian employees totalled 1.2 hours. This is far below the level recorded for the United States. German unions are critical of overtime work because it lessens the positive employment effects of working time reductions. Flexible working hours diminishes the need for overtime. Also, an increasing number of workers are being remunerated in compensatory time rather than paid overtime.

Given the current difficulties facing the German economy and declining membership, the IG Metall seems to be backing away from its demands for shorter working hours. In its negotiations for a 1997 contract, the union offered a contract that would postpone the push to a shorter working week, provided troubled companies with a clause to break from labor agreements, and limit wage increases to the annual rate of inflation. In return, the union is asking companies to increase hiring substantially within 3 years.

## FRANCE

This section is not yet completed.

## WORKING HOURS, WORK SCHEDULING AND THE LAW

The governments in the United States, Germany and France have taken different approaches to influencing working time patterns in the 1980s and 1990s. The United States government has not had a systematic policy toward working time. The German government tried to use its influence to forestall the push to shorter working hours and passed legislation to foster numerical flexibility and working time flexibility. The French government actively pushed for work-sharing policies while at the same time passing legislation allowing for more numerical flexibility and working time flexibility.

### United States

The laws which were passed in the 1980s and the changing employment practices of the federal government had, from a society-wide perspective, minimal impact on the overall patterns of working time. However, pending legislation dealing with overtime pay would, if passed, significantly influence the working week of many full-time workers.

Laws were passed relating to employee leasing, short-time compensation and pre-notification of layoffs and firings. Though growing rapidly in number, still relatively few employees are leased employee, and relatively few employers participate in short-time compensation programs. Large employers are now required to give 60 days notice prior to instituting large-scale layoffs and firings. However, the pre-notification requirement does not seem to have changed the likelihood of layoffs and firings. Downsizing still seems to be a favored tool of human resource management.

The federal government implemented policies designed to expand flexible working time arrangements for its employees. The permanent part-time category was introduced in 1978. In 1985, the Reagan administration increased the ability of government agencies to utilize temporary employees.

Of more significance than the laws which have been passed and the programs implemented is a bill still in Congressional committee. Introduced in 1995 by Senate Republicans, the Work and Family Integration Act amends the Fair Labor Standards Act of 1938 by establishing a 160-hour, 4-week period with no overtime pay. Designed to give management greater flexibility in setting workers' hours, it would enable employers to schedule weekend work with no premium pay, super-long work days and endless work weeks followed by longer time off. In addition, compensatory time would be allowed to be given instead of overtime pay for hours worked beyond the 160 hours in a 4 week period.

Supporters of the legislation, and the title of the bill, suggest that it is only about flexible schedules for working parents so as to enable parents to better balance personal and work responsibilities. However, if passed the reality is likely to be growing conflict between work and family life as work schedules vary more than currently at the whim of the employer. At the same time, the employer receives overtime work without

paying for it.

This bill succinctly captures a major difference between the United States and the European policy and collective bargaining context. In the United States, more flexible working hours for full-time workers are being discussed and implemented without any quid pro quos for the workers. That has not been the experience in Germany and France.

#### Germany

There is more legal regulation of working time in Germany than in the United States. Thus, changes in working time regulation generally take on more significance in Germany than in the United States. The German government has been interested in increasing labor market flexibility. It has not been supportive of work sharing by reducing the standard full-time working week. In fact, the current German government is disturbed by how little work German workers are doing. According to Chancellor Kohl:

A successful industrial nation--which means a nation with a future--doesn't allow itself to be organized as a collective amusement park (Benjamin, 1993).

For over 50 years, German working time was regulated by the Working Time Act of 1938. It regulated daily working time and had a number of provisions relating to flexible working arrangements. There was a 48-hour standard working week divided into 6 working days, 8 hours in length. Overtime was permissible only under certain circumstances including fluctuating work loads and "special" operational situations (such as maintenance work). Where overtime was being paid, daily working time, including overtime, could be extended for up to 10 hours for up to 30 days per year. Where overtime was not being paid, fluctuations in individual working time was quite restricted with an evening out occurring within a period of two weeks at most. Provisions for breaks, rest periods between shifts and overtime pay were also included. The law set minimum standards which were often improved upon in collective bargaining (Trinczek, 1995).

In addition, Sunday work, except in rare instances, had been prohibited since 1869. In 1968, minimum paid holidays of 18 working days were established.

Both unions and employers found the Working Time Act of 1938 to be lacking. Unions wanted what had become the standard working week--five days at 40 hours from Monday to Friday--to be put into law. They were also interested in limiting the possibility of lengthening daily working hours. Employers felt the law limited their needs for increased working time flexibility. They also wanted the legal limits to Sunday work removed. Klaus Friedrich, chief economist at Dresdner Bank, stated the employers' position quite pithily:

The basic question in Europe should be how to make our economies flexible enough to create jobs with low growth. In other words, get rid of regulations like no weekend work in Germany. The machinery is not Catholic or Protestant (Cohen, 1993).



A new working time law was passed in 1994 replacing the Working Time Act of 1938. It was more in line with the employers' point of view and provided a comparatively wide scope for the flexibility of working time. It retained the 48 hour work week as the standard. Unlike in the previous law, the working day can be extended for any reason. When working hours fluctuate weekly, the law extends the maximum evening out period from 2 to 16 weeks. And it permitted employers and unions to extend the evening out for longer if they wished (Trinczek, 1995). Sunday work would now be allowed for economic reasons if competition abroad worked on Sundays and the competitiveness of German products would be endangered if they could not be produced on Sundays.

In addition to weakening regulations on the scheduling of working hours, the German government weakened the rules and regulations regarding employment security and worker protection. The Employment Promotion Act of 1985 amended existing rules with the goal of opening up new opportunities for the unemployed. It allowed for the greater use of individuals on fixed term contracts. Previously fixed-term hires could only be for a maximum of 6 months and for specified reasons, not including economic uncertainty. Now fixed-term contracts could last for up to 18 months without any need for justification. The maximum permissible period for use of personnel hired from temporary agencies was extended from 3 to 6 months. Part-time work was made more attractive. Small firms and newly established firms were granted relief from rules regarding worker protection and newly established small firms were given special permission to use workers on fixed-term contracts for up to 2 years. Employers, generally, were given increased freedom to lay off workers without consulting the works council in the plant (Bosch and Sengenberger, 1989; Buechtemann, 1993). Currently, the German government is proposing further measures to ease employers' ability to fire workers.

In 1994, workers on fixed term contracts constituted 10.2% of total employment, somewhat greater than their share of total employment in the late 1980s (Employment Observatory, 1996, p. 21; Buechtemann, 1993, p. 287). However, the Employment Promotion Act did not begin the trend toward temporary employment. Dombois (1989) shows that the proportion of temporary hiring in relation to job vacancies had increased before the law had been enacted. He views the law as legitimizing the practice of temporary employment rather than being the primary factor behind the spread of temporary employment.

While favoring numerical flexibility and working time flexibility, the German government has been staunchly opposed to reducing the standard working week. In 1983, the government tried to divide unions by developing an alternative means for lowering unemployment other than reduced working hours. The government passed a law allowing for early retirement five years before the formal (statutory) retirement age of 63. The



government did not succeed in lessening the workers resolve for shorter working time.

More recently, in April 1996 Chancellor Kohl introduced legislation making it easier for many companies to hire and fire workers. The legal change will exempt companies with 10 or fewer employees from Germany's laws regulating firings, compared with the existing exemption for companies with only 5 or fewer workers. The German government is also interested in allowing employers to hire workers on fixed term contracts for longer periods of time. They would like to allow fixed-term contracts to last for up to 24 months rather than the current limit of 18 months.

#### France

While the German government opposed work sharing through reducing the full-time work week, the socialist government in France, at least initially, made it a crucial component of its employment policy. The socialists were elected in 1981 and were committed to lowering unemployment.

They had hoped that firm level bargaining over work sharing would occur. But negotiations foundered over whether there would be full wage compensation for the decline in the full-time work week. Agreements were not concluded.

Instead legislation was passed in 1982 imposing work sharing. The legal work week was reduced from 40 to 39 hours, the first step toward a 35-hour work week (The government eventually ruled that full wage compensation was to occur.) Workers could work up to 48 hours a week (with a daily maximum of 10 hours), but not exceed an average of 46 hours a week over 12 weeks. Possibilities for overtime were reduced. There would be an annual quota of 130 hours of overtime per worker. For any overtime hours beyond that figure, workers would need to be offered compensation in time, not money. Paid vacations were lengthened from 4 to 5 weeks annually. The normal retirement age was lowered from 65 to 60 (Tremblay, 1989).

France, initially at least, did not make the increased use of temporary workers or fixed-term contracts a central aspect of its employment policy. In 1982, a law was passed restricting the use of such contracts. Temporary workers could be used only to replace absent employees or to handle an exceptional or transitory work load. Temporary workers were to have the same social rights in terms of salaries, fringe benefits and working conditions as more permanent employees. Temporary workers declined substantially in number (Charraud, 1993).

From 1982 to 1985, various Solidarity Contracts were in operation. One concerned working time reduction. Firms which signed these contracts with the government were exempted from a part of their social insurance contributions on any new jobs created as a result of reducing weekly working time. Eventually, the program was changed whereby firms which shortened working hours and maintained employment levels, rather than reducing them, received a government subsidy. Another concerned

encouraging early retirement or partial early retirement and replacing the retirees with younger workers.

The work sharing policies were only partially successful. The early retirement policy was a success. However, few firms signed the Solidarity Contract regarding shortening working hours. Few jobs were thought to have been created by the one hour reduction in the standard working week (Gauvin and Michon, 1989; Tremblay, 1989). Unemployment remained high. The country was also suffering from a worsening balance of payments constraint. Concern was raised about the ability of French firms to compete in the international market.

As a result, from 1985 on, the emphasis shifted from work sharing to working time flexibility. Working time policies were designed with the goal of enhancing efficiency in mind. Jobs would be created if French firms were better able to compete in the world market.

Laying the groundwork for this new approach to working time was a government commissioned report--Taddei report--which argued that the crucial problem facing French industry was the short duration of capital operating time. Not only was the productive equipment not being utilized to its fullest, the length of operating time had declined slowly, but steadily, since 1973. Significant changes in work organization, particularly the extension of shift work, was required to increase the rate of capacity utilization. Additional but shorter daily shifts spread over a 6-day work week could be created to operate equipment without resorting to night work or Sunday work. The government should provide incentives for employers and unions to negotiate changes in the organization of work at the firm or industry level (Jallade, 1991).

The Delebarre Law, passed in 1986, was designed to increase the freedom of employers to schedule work. In return, the workers would receive some reduction in work hours. The aim of the law was to get unions and employers to think of working time in an annual perspective. If this was to occur, capital equipment would be deployed more effectively and expensive overtime would be reduced. Monthly wages would not reflect variations in working time but would rather be calculated on the basis of the total annual hours of work. Opportunities for overtime were curtailed and the nature of compensation for overtime was changed.

More specifically, unions and employers could negotiate sector agreements under which employers could vary weekly working schedules up to a limit of 42 hours per week if the annual average work week did not exceed 38 hours. Working hours could go as high as 44 hours in a week if the annual average work week did not exceed 37 hours. Any hours in excess of 39 hours in a week would not be considered overtime if employers stayed within these basic limits. The annual overtime quota was cut from 130 to 80 hours. Compensatory time may be given instead of overtime pay.

The Delebarre Law was replaced by the Seguin Law a year



later when the Right returned to power. Working hours were made even more flexible but no longer was there to be a necessary link between flexible working hours and shorter working hours. The employers' arguments were now being taken as the basis for working time policy. Now employers and unions could negotiate flexible scheduling agreements directly at the firm and plant level. If such an agreement was concluded, there was no need to include within it a reduction of working time. Others forms of compensation could be negotiated such as pay, training, or a different length of the work day. The overtime quota was raised back to 130 hours and overtime hours could be calculated over a period of several weeks. The working week could exceed 44 hours if that is agreed to by unions and employers negotiating at the sector level (Gauvin, 1994; Lallement, 1995).

Not only did the employer perspective come to dominate discussions of working hours, it also served to frame policy regarding temporary employment. Under pressure from employers wanting greater flexibility in the use of temporary workers, the government granted them the freedom to use temporary workers under any circumstance as long as a contract was drawn up for a specific job and the job was not part of the regular on-going activities of the firm. (Charraud, 1993).

And employer freedom to lay off workers was enhanced by the Chirac government. No longer would there need to be administrative authorization for layoffs. In practice the requirement to get administrative authorization may not have affected employer behavior. Nevertheless, this was a potent symbol of the push to sweep away labor market "rigidities" (Howell, 1992).

The trend toward flexible working hours was further confirmed by the Labor, Employment and Vocational Training Act of 1993. The reduction of working hours reemerged as a goal of government policy. The law institutionalized the notion of "an apportionment of working time over the entire year or a portion thereof, involving in particular a collective reduction of that time, by convention or labor agreement". To generate new openings or forestall layoffs, the law provided employees and employers with incentives to convert full-time jobs into part-time jobs. Also, employers were encouraged to hire part-time workers in general (Lallement, 1995, p. 135).

Unemployment remains high in France. In May 1996, unions held demonstrations in Paris demanding a cut in the work week to reduce France's 11.8% unemployment rate. The current Right government seems more open to work sharing proposals. Prime Minister Juppe has raised the possibility of providing French employers with tax incentives if they reach agreements with unions to reduce the work week in order to create employment.

## CONCLUSION

The United States and European societies faced difficult economic times in the 1980s. Unemployment rates rose to levels not seen since the Great Depression and they remain high today in

many European societies including Germany and France. Rules regarding employment protection, part-time and temporary labor, the length of working time and the flexibility of working time have been at the heart of the policy debate over job creation and competitiveness in Germany and France.

Unions in France and Germany generally favor work-sharing policies, including shortening weekly working time, to increase employment and lower unemployment. Employers are generally critical of such policies believing instead that rigidities in the labor market are one of the chief causes of the high unemployment. These rigidities, due primarily to actions of labor unions and governments, need to be eliminated if market forces are to be liberated. Freeing up market forces will lead to a more well-functioning flexible labor market. This, in turn, will have beneficial effects on unemployment and productivity. The German government has generally sided with the employers while the French government has vacillated between the positions of the unions and the employers.

Working hours in Germany have been shortened mainly due to union bargaining power and in France mainly due to government policy. In both societies, working hours have become more flexible as a result of government actions as well as employer pressure.

In the United States, working hours have lengthened and working time has become more flexible. For the most part, the increased flexibility has not been the result of explicit governmental job creation policies. Rather, employers through decentralized decisionmaking have pushed for increased flexibility and longer hours in order to raise the rate of profit. And organized labor has, in many instances, not been strong enough to counter employer demands.

The cross-country variations in collective bargaining and government policy regarding working time raises the question of whether the United States, Germany and France are, either explicitly or implicitly, pursuing different approaches for improving their competitive positions in the world market. Is the United States pursuing a strategy of improving competitiveness by emphasizing low pay and long hours while France and Germany are following strategies combining shorter but more flexible hours with technological progress. And if this distinction is in fact useful, which path will ultimately generate stronger economic development and a higher and healthier standard of living? Only time will tell.

#### FOOTNOTES

<sup>1</sup>The movement for shorter hours faded after the Great Depression of the 1930s. See Hunnicut (1984) and Roediger and Foner (1989) for analyses of the demise of the shorter hours movement.

<sup>2</sup>For a more detailed discussion of arguments surrounding restrictions on dismissals, see Buechtemann (1993).

<sup>3</sup>See Bosch (1995) and Cetto and Taddei (1993) for a more detailed discussion of the arguments in favor of working time flexibility.

<sup>4</sup>The discussion of working time and collective bargaining in the United States is based on Rosenberg (1991), Rosenberg (1993), Rosenberg (1994a) and Rosenberg (1994b).



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